Audit Report

CONSTRUCTION AND REHABILITATION OF RESERVE COMPONENTS INDOOR SMALL-ARMS RANGES

Report No. 99-250 September 15, 1999

Office of the Inspector General
Department of Defense

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Acronyms

AIRR	Army National Guard Indoor Range Rehabilitation
ARNG	Army National Guard
NIOSH	National Institute of Occupational Safety and Health
STARC	State Area Command
USARC	U.S. Army Reserve Command

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

September 13, 1999

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (RESERVE AFFAIRS)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Evaluation Report on Construction and Rehabilitation of Reserve Component Indoor Small-Arms Ranges (Report No. 99-250)

We are providing this report for information and use. This is the second of two reports on indoor small-arms ranges and was developed in response to a request by the Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities). We considered management comments on a draft of this report when preparing the final report. Those comments were responsive to the finding and recommendations; however, we request that the National Guard Bureau provide milestones for implementing the corrective actions by November 12, 1999.

We appreciate the courtesies extended to the evaluation staff. Questions on the evaluation should be directed to Ms. Patricia A. Brannin at (703) 604-9002 (DSN 664-9002) or Ms. Lorretta F. Swanson at (703) 604-9408 (DSN 664-9408). See Appendix J for the report distribution. The audit team members are listed inside the back cover.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 99-250 **September 13, 1999**
(Project No. 7RO-5044.01)

Construction and Rehabilitation of Reserve Component Indoor Small-Arms Ranges

Executive Summary

Introduction. This evaluation responds to a request from the Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), asking us to evaluate the indoor range program. The Director reported several indications that the large infrastructure of small-arms firing ranges may be excessive to actual training needs. If so, continued funding for the construction, rehabilitation, operations, and maintenance of some ranges may not be an efficient use of limited Reserve Component training funds.

As the second of two reports on indoor small-arms ranges, this report evaluates the construction and rehabilitation of indoor live-fire ranges in support of small-arms training and qualification.

Objectives. Our objective was to determine whether newly constructed and rehabilitated indoor live-fire ranges are used effectively and efficiently to support small arms training and qualification. We also evaluated the management control program as it applies in those areas.

Evaluation Results. The Army National Guard and the U.S. Army Reserve Command need to improve their oversight and management of indoor range construction and rehabilitation approval process. Sixty percent, or 255 of 425 U.S. Army Reserve Command and Army National Guard indoor ranges constructed and rehabilitated since 1980, were under-used and closed, and 43 percent (110) of the closed ranges had little or no use for live-fire training. Although the ranges were closed and not used for training, the Army National Guard and Army Reserve Command reported no discernable effect on reported weapons qualification and unit readiness. Indoor ranges with an estimated value up to $54 million were constructed but were not used. For details of the evaluation results, see the Finding Section. See Appendix A for the details of the review of the management control program.

Summary of Recommendations. We recommend that the Assistant Secretary of Defense (Reserve Affairs) implement a standard methodology and cost factors for assessing new indoor range construction and rehabilitation. We recommend that Joint Services Reserve Component Facility Boards review all proposed new range construction and rehabilitation projects, regardless of estimated costs. We also recommend that the Director, Army National Guard, revise guidance.

Management Comments. The Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities) concurred with most of the recommendations. The Army National Guard concurred with the recommendations to review all new construction or rehabilitation of indoor ranges and to submit the range designs or design contracts to the National Guard Bureau if the state does not have qualified

individuals to ensure that design and equipment provide minimum laminar airflow. The Army National Guard nonconcurred with the other initial recommendations pertaining to guidance, but provided alternative solutions. The Army National Guard agreed to (1) amend the indoor range check list to require sufficient level signature authority and to require that the project inspection report specifically stipulate that the range is totally complete with no exceptions; (2) require states to submit a separate economic analysis and life-cycle study on proposed range construction, addition, or rehabilitation; and (3) raise the classification of indoor ranges to a special category, which requires justification above and beyond current requirements. A discussion of the management comments is in the Finding Section of the report, and the complete text is in the Management Comments Section.

Evaluation Response. The proposed action for the recommendation with which the Deputy Assistant Secretary partially concurred is responsive. We deleted Recommendation 1.e., with which the Deputy Assistant Secretary of Defense for Reserve Affairs nonconcurred, and renumbered Recommendation 1.f. as Recommendation 1.e. The alternative solutions provided by the National Guard Bureau meet the intent of the recommendations. We request the National Guard Bureau to provide milestones for implementing the corrective actions by November 12, 1999.

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Background

This evaluation responds to a request from the Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities) asking us to evaluate the indoor range program. The Director reported several indications that the large infrastructure of small-arms firing ranges may be excessive to actual training needs. If so, continued funding for the construction, rehabilitation, operations, and maintenance of some ranges may not be an efficient use of limited Reserve Component training funds. Both outdoor and indoor small-arms ranges support required small-arms training. However, this report deals only with indoor ranges.

As the second of two reports on small arms ranges, this report evaluates the construction and rehabilitation of indoor live-fire ranges in support of small-arms training and qualification.

Need for Indoor Ranges. The Army National Guard (ARNG) and U.S. Army Reserve Command (USARC) use small-arms ranges to achieve marksmanship goals that support operational readiness. The Army prefers that all Reserve units schedule qualification firing on outdoor ranges that meet Army standards and that are within no more than 2 hours travel time. Reserve units use indoor ranges for weapons familiarization and prequalification training. However, Reserve units sometimes use indoor ranges to conduct annual qualification firing when outdoor ranges are too far away or when they are unavailable.

Number of Indoor Ranges. The ARNG and USARC have approximately 1,516 indoor ranges. Officials in the Office of the Chief of Safety and Occupational Health Division, ARNG, estimate a range inventory of 1,125 small-arms indoor ranges.[1] Officials in the Office of the Deputy Chief of Staff, Engineers, USARC, report an indoor small-arms range inventory of approximately 391. DoD provides new and rehabilitated facilities for ARNG and USARC training missions. DoD policy states that the ARNG and USARC must provide training facilities ". . . in the most economical manner to meet operational and training needs.[2]"

Validating and Approving New Ranges. The process to justify, validate, and approve funding for a new indoor range or for rehabilitating an existing one is meant to prevent unnecessary construction. Current policy states that the ARNG and USARC can approve Federal funds to build an indoor range only after the establishment of a valid training requirement. DoD funds all USARC indoor range construction, operations, and maintenance. Individual States and the Federal Government share in funding validated ARNG range construction requirements. The National Guard Bureau validates State Area Command (STARC) requirements and approves requests for Federal funding based on the

[1] Data developed during the evaluation showed 1,379 ARNG indoor ranges.

[2] DoD Directive 1225.7, "Programs and Procedures for Reserve Component Facilities and Unit Stationing," March 18, 1996.

availability of funds and overall ARNG needs. The current Long-Range Construction Program Plan for the ARNG lists and ranks all validated STARC construction requirements.

When officials of the National Guard Bureau Training Division validate a training requirement, they authorize a prescribed amount of space for an indoor range. ARNG construction standards provide for an indoor range designed for live-fire training for a minimum of 25 years.

Indoor Range Funding. An indoor range represents some of the most expensive space in an armory (sometimes called a readiness center) because of required design features, engineering controls, and range equipment. STARCs usually build new indoor ranges as part of a new armory, an older armory replacement, or an armory modernization project that receives Federal Major Military Construction funds. The Federal Government provides 75 percent or more of all armory construction and rehabilitation costs. Officials of the National Guard Bureau and the STARC sign a Military Construction Cooperative Agreement (formerly known as Federal-State Agreements for Armory Projects) describing the terms and conditions that apply to each major construction project. The cooperative agreement must be based on a bona fide need for new or rehabilitated facilities.

A range that is rehabilitated or constructed as an "add-on" to a training facility or as a separate "stand-alone" facility can be funded in a number of ways. It can receive full State funding, Federal Operations and Maintenance funding, or Federal Specified or Unspecified Military Construction funding.

STARCs Fund Operations and Maintenance. Military Construction Cooperative Agreements require each STARC to maintain the armory facilities, including indoor ranges, ". . . at its own expense" during the period of the agreement, which can extend from 5 to 25 years. Generally, STARCs must fully fund the cost of lead cleanup for routine indoor range maintenance and operations, which have grown significantly since 1980 because of increased health, safety, and environmental requirements. However, STARCs receive a fixed amount of Federal operations and maintenance funds that they can use only for training related to the Federal mission. STARCs can also be reimbursed for the costs of disposing of hazardous wastes, such as lead and lead dust generated from live firing.

Objectives

The overall evaluation objective was to determine whether newly constructed and rehabilitated indoor live-fire ranges were used effectively and efficiently to support small-arms training and qualification. The report also addresses the management control program as it applies in those areas.

See Appendix A for a discussion of the evaluation scope and methodology, a summary of prior coverage, and the management control program review.

USARC Standards and Policy. USARC officials told us that they do not intend to spend the funds necessary to build or rehabilitate any indoor

ranges for future live-firing. A list of all 391 USARC indoor ranges showed that some had already been converted to other uses, such as storage rooms, and that only 11 were still being used for live-fire training. While the intent of USARC had not been established in formal policy, USARC officials provided information on "USARC Weapons Training Strategy for the 21st Century." According to a memorandum dated October 9, 1997, signed by the USARC Deputy Commanding General, ". . . it is (my) intention to reengineer the weapons training process for the USARC." A key USARC strategic goal is to "Develop a home station weapons training and qualification alternative to current training and qualifications methods."

The USARC training strategy includes cleaning and converting indoor range space, as necessary, for use as weapons simulator training rooms. For this reason, the primary focus of the evaluation was ARNG indoor ranges. However, the USARC should formalize its intent not to build or rehabilitate indoor ranges or should take measures similar to those recommended in this report to ensure that unneeded ranges are not built or rehabilitated in the future. At a minimum, the USARC should issue policy consistent with its stated intent to not build or rehabilitate any indoor ranges in the future.

Range Justification and Validation Process Needs Improvement

Sixty percent, or 255 of 425 USARC and ARNG indoor ranges constructed and rehabilitated since 1980, were under-used and closed. Forty-three percent (110) of the closed ranges had little or no use for live-fire training. The high percentage of range closures was primarily because validation criteria did not include analyses of the life-cycle costs and affordability of operating and maintaining the ranges. As a consequence, the National Guard did not consider all alternatives to constructing and rehabilitating indoor ranges. STARCs closed many ranges because they could not afford routine and periodic operations and maintenance costs caused primarily by increased environmental cost, but there was little or no effect on reported weapons qualification and unit readiness. As a result of the material management control weaknesses, the facilities program was not making optimum use of funding.

Indoor Range Standards and Policies

We evaluated only those ranges constructed or rehabilitated since 1980 because they have to meet recommended Federal and DoD standards for indoor range design, work practices, and housekeeping.

Federal and DoD Standards and Policies. DoD policy is to comply with Federal occupational safety and health standards such as those recommended by the National Institute of Occupational Safety and Health (NIOSH)[3] and the Occupational Safety and Health Administration.[4] In 1976, NIOSH issued recommendations specifically for indoor range design, operations, and maintenance to reduce safety and health hazards from range-generated lead. NIOSH indoor range operating standards recommended equipping indoor ranges with properly designed airflow and ventilation systems and conducting routine and periodic cleaning and decontamination. NIOSH range standards and Federal safety and health regulations have increased range operations and maintenance requirements and, as a consequence, increased costs.

Army and ARNG Standards and Policy. In the early 1980s, the Army and ARNG began implementing indoor firing range design and operating standards to comply with NIOSH recommendations and standards. In 1982, few indoor ranges could meet the NIOSH standards. Many indoor ranges had to be rehabilitated or reconstructed to meet design specifications and airflow and ventilation requirements.

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[3] Department of Defense Directive 1000.3, "Safety and Occupational Health Policy of the Department of Defense," March 29, 1979, and Department of Defense Instruction 6055.1, "DoD Occupational Safety and Health Program," October 26, 1984.

[4] General Industry Standards, Title 29, Code of Federal Regulations, 1981 Edition, Part 1910, Section 1025, "Lead."

In the early 1990s, the Army and ARNG revised indoor range policy to include specific requirements for routine and periodic cleaning and decontamination. These requirements, along with the earlier operations standards, added significantly to the costs of operating and maintaining indoor ranges. See Appendix B, "Design and Housekeeping Standards for Indoor Ranges," for a detailed discussion of Federal and DoD indoor range standards.

Indoor Ranges Constructed or Rehabilitated and Then Closed

Since 1980, ARNG and USARC officials validated requirements and approved Federal funding for the construction and rehabilitation of 255 indoor ranges that were not used effectively to accomplish Army small-arms training and qualification requirements. The following table shows that at least 425 indoor ranges were built and rehabilitated from 1980 through 1997, and 60 percent, or 255, were closed even though they were built to last at least 25 years. Appendix D lists ranges constructed since 1980 and their status; Appendix E lists ranges built and never used by state, location, and year built; and Appendixes F and G provide specific data on rehabilitated ranges.

ARNG and USARC Range Construction and Rehabilitation
1980-1997

Component	Ranges	Active	Closed	(Never Used)	(Little Used)
ARNG (STARCs)	423	170	253*	(65)	(43)
USARC	2	0	2	(2)	
Total	425	170 (40 percent)	255* (60 percent)*	(67)	(43)

*Range rehabilitation project at the Sea Girt New Jersey range was funded but not yet started; it was not included in our total

Forty-three percent, or 110, of the closed ranges had no use (67) or little use (43) for live-fire training. Closed ranges are those that STARCs were not using for live-fire training. Although STARCs converted many closed ranges to other uses, some could still be reopened. We also visited some active ranges that had not been used for live-fire training for several years. The tables in Appendixes D and F show that most of the ranges were newly constructed rather than rehabilitated.

According to the ARNG Infrastructure Requirements Plan, FY 1998, the ARNG had an annual military construction budget of $50 million. However, its annual construction requirement was estimated at more than $400 million.

> Each year a number of Readiness Centers that are not already considered inadequate reach 57 years of age. . . . Given today's current budget level it will require an additional $50 million in funding over 97 years to replace all inadequate Readiness Centers (armories). . . . Although new facilities may be built to replace existing ones, the requirement to sustain and maintain them requires additional funding.

The high percentage of range closures and the need for more efficient and effective use of limited construction funds in the future demand improvement in the management of ARNG indoor range construction and rehabilitation projects. Management improvements are needed to ensure that Federal funds are not used to build or rehabilitate unneeded or unused ranges.

Range Justification and Validation Process

There was a need for improvements in the indoor range justification and validation process. The primary justification for an indoor range was a validated training requirement. However, the justification and validation process did not adequately consider the cost to operate and maintain the indoor range and did not consider more cost effective ways to meet the training requirement, given the cost to operate and maintain the indoor range.

Military Construction Cooperative Agreements. The ARNG and STARCs must base a Military Construction Cooperative Agreement on a bona fide need for new or rehabilitated facilities. However, when a STARC builds a new range as part of an overall armory project, the agreement does not include a separate finding and statement of need for the indoor range.

Justification and Validation Process. STARCs submit range requirement justifications to the National Guard Bureau for validation and funding approval. Based, in part, on the information provided by the STARCs, ARNG validates the need for new indoor range facilities. If validated, the National Guard Bureau approves range construction funding, and the STARC builds the range when funds become available. The ARNG uses the time and distance to reach adequate Army ranges as the basic criteria for justifying and validating indoor range construction and rehabilitation requirements.

Range Location Criteria Checklist. STARCs use DD Forms 1390 and 1391, "FY 19XX Guard and Reserve Military Construction," to identify requirements for a proposed armory construction project. Appendix B of the ARNG, "Instruction for Preparation of DD Forms 1390/91 Series, Military Construction," December 1, 1997, states that a 2,300-square-foot, 25-meter indoor range can be authorized as part of the total space allowance for new armories, if the training requirement for the range is validated and approved by the National Guard Bureau, Range and Training Land Program Officer.

Footnote 1 in Appendix B of the ARNG instruction for preparing DD Forms 1390 and 1391 requires STARCs to supplement DD Forms 1390 and 1391 with a Range Location Criteria Checklist, which the STARCs use to justify and the National Guard Bureau uses to validate an indoor range built as part of an overall armory project. Appendix C of the same instruction says that an 1,800-square-foot, 15-meter range can be authorized for armory additions or alterations (rehabilitation), with no mention of the checklist requirement or the need for further justification and approval. Table 2-1 of National Guard Pamphlet 415-12 (draft), "Facilities Engineering - Army National Guard Facilities Allowances," August 14, 1998, states that range construction must be approved by the National Guard Bureau, but it does not mention the checklist.

STARCs must identify and document the location of all nearby, adequate indoor ranges on the checklist. The National Guard Bureau defines an adequate range as "an indoor range that is within 30 minutes driving time for military convoys and an outdoor range that is within 60 minutes driving time for military convoys." The range must meet ARNG safety requirements, be under military control, and be available for scheduled use.

The National Guard Bureau, Range and Training Land Officer, said that, while not explicitly stated on the checklist, the ARNG only requires STARCs to list adequate Army ranges within the prescribed distance. As a rule, STARCs do not list nearby, adequate indoor and outdoor ranges belonging to other organizations such as the other Services and local, State, and Federal law enforcement agencies. The Army Audit Agency in 1987 and DoD Instruction 4000.19, "Interservice and Intragovernmental Support," August 9, 1995, suggested that nearby, adequate ranges be considered.

Although the checklist and time and distance criteria were useful to the ARNG, they were not always effective in establishing a bona fide need for an indoor range or for preventing the construction of unneeded or unused ranges.

Other Factors Impacting Range Use. All factors that impact the eventual use of indoor ranges were either not considered or not effectively assessed as part of the indoor range justification and validation process. While the process included an analysis of alternatives to indoor range construction, the analysis was restricted to alternative Army ranges and did not include all nearby civilian and non-Army military indoor ranges or the continued use of nearby outdoor ranges. Furthermore, the justification and validation process did not include an assessment of the life-cycle costs and affordability of indoor range operations and maintenance.

Indoor Range Validation Criteria and Alternatives Assessment

The high percentage of closures of modern ranges was caused primarily by a range justification and validation process that did not include effective validation criteria and an analysis of all alternatives to constructing and rehabilitating indoor ranges. The ARNG used the time and distance to reach adequate Army ranges as the basic criteria for validating new range construction or rehabilitation.

In many cases, the decision to close an indoor firing range was reinforced by the availability of standard, record-fire outdoor ranges or alternative course, 25-meter outdoor ranges. Also, indoor range closures were facilitated by the increasing availability and affordability of weapons training simulators. Because of the high rate of indoor range closures, the National Guard Bureau needs to strengthen validation criteria and require documented assessments of all alternatives before validating and approving new range construction and rehabilitation.

Army Outdoor Range Policy. Army training doctrine states that full-scale, standard-record-fire outdoor ranges represent the preferred method for weapons qualification. Weapons qualification is done at outdoor ranges whenever possible. In recent years, changes in Active Component range-use policy for Reserve units, construction of outdoor regional Reserve Component facilities training centers, and the transfer of some Active Component facilities to the Reserve Components (for example, Fort Dix, New Jersey) made it easier and more convenient for ARNG units to share some Active Component ranges.

STARCs Use Outdoor Ranges. STARCs in Illinois, Tennessee, New Jersey, Georgia, Florida, Missouri, Alaska, Maine, Texas, South Carolina, and Puerto Rico reported range closures facilitated by the availability of outdoor ranges that could be used for both training and qualification. For example, a Florida STARC official wrote, "The long-range plan will be to clean and convert IFRs [indoor firing ranges] to be used for other purposes and to use only outdoor ranges for small-arms familiarization and qualification firing."

A Maine STARC official wrote that Maine had just built an outdoor, baffled range in Bangor that was cheaper to operate than its indoor range in Bangor, which is now closed. In addition, using outdoor ranges doubles as cold-weather training for Maine units.

The Georgia STARC reported that it planned to close all of its 56 indoor ranges. Only five ranges were still active. Units in Georgia reported little or no impact on readiness due to range closures because they had ready access to many standard outdoor Army ranges, both within the State and in neighboring states. The Georgia STARC was also building a new regional training center with outdoor ranges.

Furthermore, at least one application for Unspecified Minor Construction project funding in New Jersey was approved, even though the application listed nearby alternative facilities. In this case, the alternative facilities were at an outdoor range located within walking distance of the proposed indoor range rehabilitation project and at Fort Dix, New Jersey, which was located approximately 1 hour away. See Appendix C, "Comments on Ranges," for specific examples.

Army Audit Agency Reported Similar Conditions in 1987. The examples are similar to those in a 1987 Army Audit Agency report that states, "Many State Guard units were adhering to this [Army outdoor range] policy and using available outdoor ranges. However, State Guards want to upgrade unsafe indoor ranges even though outdoor ranges are available." The report states that the number of ranges needing to be upgraded was overstated. Also, the report

states that the National Guard Bureau did not require STARCs to consider the continued use of available outdoor ranges and the joint use of indoor ranges as viable alternatives to new range construction.

The Army Audit Agency report lists 23 specific indoor ranges scheduled for construction in FYs 1987 through 1989. It also listed corresponding, nearby ranges belonging to the ARNG, the Army, and the Marine Corps, as well as those belonging to State, local, and Federal law enforcement agencies that could be used instead. The report recommended that the ARNG not build the 23 ranges. Nevertheless, the ARNG built 14 of the 23 proposed ranges from FY 1988 through FY 1989. As of August 1997, only 8 of the 14 ranges were still active.

STARC and USARC Use of Weapons Training Simulators. According to Army policy, Reserve Components cannot conduct annual weapons qualification on simulators or other training devices. However, simulator use has been an integral part of Army small weapons training doctrine since 1993, with the incorporation of the results of an Army task force on training ammunition into the Department of the Army Pamphlet 350-38, "Standards in Weapons Training." The February 15, 1993, version of the pamphlet states that, "Training aids, devices, simulators, and simulations . . . systems will be used in addition to ammunition required to achieve standards."

The ARNG has approximately 200 simulators located in all states, territories, and the District of Columbia. The ARNG spent $2.7 million to upgrade fielded simulators and to buy more simulator systems.

The USARC and some STARCs were also purchasing, testing, and using other training devices such as laser marksmanship training devices. Such devices may not require special facilities.

ARNG units use both simulators and training devices primarily for individual weapons familiarization and for prequalification practice. According to the ARNG 415-1, "Design Guide for Armories," June 1, 1997, weapons familiarization and prequalification practice were also the primary function of indoor ranges. Training personnel at the USARC and the ARNG Training and Training Technology Battle Laboratory were compiling the results of simulator tests conducted in July 1998. They expected to recommend that unit commanders be allowed to use simulators as an alternative method of fulfilling annual weapons qualification requirements.

Increased STARC Reliance on Simulators. STARCs reported an increased reliance on simulators and other training devices as a lower cost alternative to operating and maintaining indoor ranges. In some cases, STARCs were able to close all indoor ranges because they combined use of existing outdoor ranges and weapons simulators. For example, the South Carolina STARC reported closing all but 2 of its 71 indoor ranges because, "South Carolina has a central training facility in Eastover. . . . This facility is equipped with weapons simulators and live-fire [outdoor] ranges that are utilized by all units within the state . . . This is now the primary means for small-arms qualification for the South Carolina National Guard."

Simulators can save time, save ammunition costs, and improve qualification scores. STARCs in Maine and South Carolina reported that simulators were excellent recruitment and retention tools. Simulators also reduce overall energy costs and eliminate ventilation, airflow, and other health and safety issues associated with indoor range operations. Other simulator performance benefits include weapons familiarization; shoot-don't-shoot decisionmaking; and remedial training for soldiers who fail to qualify on live-fire ranges. Because of the increasing numbers and advantages of Engagement Skills Trainers as opposed to indoor ranges, STARCs should have the option of requesting a space allowance for a simulator instead of an outdoor range.

Limited Criteria and Alternative Assessments. If a proposed construction project for an armory includes an indoor range, applicants must identify all alternative Active Army and Reserve Component facilities within a 15-mile radius or the closest three facilities, regardless of mileage, on the DD Forms 1390 and 1391. Applicants must also state their reasons for rejecting each alternative and "describe the manner and extent to which mission accomplishment would be affected if the project were not approved." However, the focus of the assessment is on alternatives to the proposed armory construction, not on alternatives to the indoor range that is a proposed part of the project.

Pre-1987 Alternative Assessments. In its 1987 report, the Army Audit Agency found that the ARNG did not provide adequate guidance to the STARCs to require them to fully justify the need for indoor ranges. At that time, the STARCs were required to submit a Form 420-1R, "Review of Indoor Range Construction at New Armories," along with DD Forms 1390 and 1391. However, Form 420-1R only required information on the number of personnel who would be using the planned range and the names of existing ranges in the local area. The 1987 Army Audit Agency report states that Form 420-1R and ARNG guidance were inadequate because they did not require STARCs to provide detailed justification for constructing new ranges when existing indoor or outdoor ranges were nearby.

Post-1987 Alternative Assessments. In response to the Army Audit Agency finding, the ARNG developed and implemented a Range Location Criteria Checklist for STARCs to use to justify an indoor range built as part of an armory. The checklist required the identification of all adequate indoor ranges within 30 minutes travel time and all outdoor ranges within 60 minutes travel time.

STARCs must indicate whether state planners assessed all available range facilities during the initial planning. If an identified alternative facility is less than the established baseline for travel, STARCs must indicate whether it is adequate. STARCs must also indicate whether funds are available to travel to the alternative facilities. If an adequate alternative outdoor range is within 60 minutes, STARCs must indicate annual rainfall and whether there are fewer than 150 days per year of windchill below 32 degrees Fahrenheit. While those requirements establish a mechanism for analyzing alternatives, they do not provide decisionmakers with enough information.

Better Criteria Needed. Current time and distance criteria were not adequate for validating a bona fide need for an ARNG indoor range. Time and distance criteria need to be more closely aligned with policy contained in the Army Forces Command and National Guard Regulation 350-2, "Reserve Component Training in America's Army," first published in 1986, which set a 2-hour travel time standard. Further, the ARNG needs to restrict granting waivers to time and distance criteria.

Assessments of All Alternatives Needed. Indoor range justification and validation also need to be based on detailed assessments of all alternatives to building or rehabilitating an indoor range. As a condition for validation, the ARNG should require STARCs to identify and assess all nearby civilian and military indoor and outdoor ranges, in addition to Army ranges. Assessments should also include the extent to which weapons training simulators could be used instead of building or rehabilitating indoor ranges.

Range Checklist Needs Revisions. STARCs should be required to include detailed information on the checklist or other justification document on which alternatives were considered, which ones were discarded, and why. Information and criteria requirements should be the same for indoor range proposals documented on a range checklist or on DD Forms 1390 and 1391. The checklist should require STARCs to describe how and under what conditions the requirement for small-arms weapons training is currently being met. STARCs should also identify and describe why the range(s) they are currently using are considered unsuitable for continued use. For every construction proposal involving an indoor range, STARCs should evaluate each alternative solution for cost, benefits, and funding strategy.

The Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), agreed to develop an expanded checklist and to make it applicable to all Reserve Components requesting Federal funding for range construction or rehabilitation. However, as of August 1999, the actions had not been accomplished.

Life-Cycle Operations and Maintenance Costs and Affordability

STARCs closed many indoor ranges because they could not afford to operate and maintain them after they were built. However, the range justification and validation process did not require STARCs to estimate life-cycle operations and maintenance costs or to assess the affordability of using indoor ranges compared with existing ranges, weapons simulators, or both. When ranges were built as part of an overall armory project, indoor range costs were not identified separately. When ranges were built as separate projects, STARCs estimated only the costs associated with range design, construction, and equipment. Because life-cycle operations and maintenance costs and affordability affect whether ranges will be used effectively and efficiently for weapons training, STARCs need to estimate the costs and assess whether funds will be available to sustain and maintain indoor ranges after they are built and rehabilitated.

STARCs Fund Operations and Maintenance. State Adjutants General sign the Military Construction Cooperative Agreement and, in signing, they agree to

share funding responsibilities for operating and maintaining ARNG facilities. The agreement requires a STARC to maintain and preserve armory facilities "in a state of good repair at its own expense for the period of this agreement." However, many agreements were negotiated before anyone realized the additional costs that would result from new Federal and State safety, health, and environmental requirements and before the Army imposed range design and housekeeping requirements.

Operations and Maintenance Costs. The overall costs of operating and maintaining indoor ranges increased significantly after the implementation of indoor range design, work practice, and housekeeping standards and policy. STARC officials in Alaska, Florida, Georgia, Missouri, Maine, Maryland, Michigan, New Jersey, Puerto Rico, Tennessee, and Texas reported closing 312 indoor ranges, built before and after 1980, as a result of the high cost of range operations and maintenance.

Energy Operating Costs Increased. For example, range ventilation systems designed to meet Federal and local operating standards were difficult to install properly and maintain. They can also result in prohibitive energy costs because treated air is continuously replaced with fresh air. In Maine, the STARC reported, "Most of our indoor ranges [more than 20] have been closed due to lack of funding to bring them up to the extremely stringent modern air handling standard." The indoor range at Waterville Armory, Waterville, Maine, ". . . has not been operating because of the high cost of operating the propane heater for the air handling system." Also, officials with the Michigan STARC wrote, "The tremendous economic cost of operating the current range design wastes huge amounts of energy by using ventilation systems that remove large quantities of air."

Routine and Periodic Maintenance Costs Increased. STARCs surveyed cited the high costs of maintaining indoor ranges as a major reason why ranges have been closed since 1980 and why some ranges have never been used. Maintenance costs included the costs of cleaning and decontaminating ranges. For example, STARCs received estimates ranging from $5,000 to $40,000 for contractor services for routine and periodic cleaning and decontamination to remove lead debris and dust.

Facilities engineering personnel at the Tennessee STARC wrote that the cost of cleaning lead, lead dust, and lead products from walls, floors, and ceilings at the indoor ranges was about $12,000. Between 1980 and 1998, the Tennessee STARC built 35 indoor ranges that are now closed. In Puerto Rico, a STARC official wrote, "The environmental problems they (indoor ranges) created and the lack of funding to properly maintain them were the main reasons . . . the Puerto Rico Army National Guard has stopped using the indoor small arms ranges for live fire."

Federal Relief Sought for Costs. STARCs requested Federal Operations and Maintenance funds to maintain (clean up) indoor ranges because costs were higher than anticipated. The National Guard Bureau concluded that, in accordance with Military Construction Cooperative Agreements, the STARCs were responsible for operations costs. In response to STARC concerns over the costs, the National Guard Bureau declared in a July 28, 1992, memorandum,

All States Log Number I920323, ". . . it has been determined that cleanup of the Army indoor ranges at State-owned armories is a responsibility of the State." However, the 1992 memorandum further states that, "Any contaminated waste resulting from this cleanup is eligible for funding through the National Guard Bureau Environmental Division."

STARCs surveyed during the evaluation specifically cited the 1992 National Guard Bureau memorandum and the high cost of routine range cleanup and maintenance as the main catalysts for indoor range closure.

Federal Funds for Lead Disposal. The National Guard Bureau issued another All States Log, Number I96-0161, July 23, 1996, on indoor range lead abatement that says, "Lead cleanup for range rehabilitation, either as part of an Armory Indoor Range Rehabilitation Program project or an overall armory addition or rehabilitation, will be 100 percent Federally reimbursed." The Environmental Division of the National Guard Bureau agreed that disposing of hazardous waste (such as lead) resulting from range cleanup and decontamination was eligible for funding through the National Guard Bureau. However, STARCs are 100 percent responsible for routine operations and lead cleanup for range conversions.

The ARNG decision on cleanup was transmitted again on August 20, 1997, in All States Log Number I97-0187 to all ARNG installations. In October 1998, an official with the Office of the Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), reported that the All States Logs were issued to "relieve" the states from the costs of disposal and that the National Guard Bureau had no intention or desire to see indoor ranges closed because of higher than anticipated operations costs.

Range Use Life Cycle. STARCs cleaned and decontaminated indoor ranges and then closed them permanently or converted them to other uses. In many cases, STARCs closed ranges to avoid recurring operations and maintenance costs and environmental, safety, and health liabilities. Building and then not using a range for its intended purpose has been contrary to DoD guidance since at least 1991.[5] DoD Instruction 1225.8, "Programs and Procedures for Reserve Component Facilities and Unit Stationing," April 1, 1996, states, "New indoor ranges may be programmed and built. However, they should remain in service in that capacity." Despite the policy, as late as 1998, STARCs in Maryland, Florida, and Tennessee continued to close indoor ranges that had been used significantly less than the 25 years for which they were built because they could not afford to operate and maintain them.

Costs and Affordability Assessments Needed. Because of high closure rates and the relationship of operations and maintenance costs to range closures, consideration of life-cycle operations and maintenance costs and their

[5] DoD Directive 1225.7, "Reserve Component Facilities Programs and Unit Stationing," November 9, 1991, Change 1, May 1992, states, "New indoor ranges may be programmed and built. However, they should remain in service in that capacity." The provision was deleted in the March 18, 1996, revision.

affordability should become an integral part of the decision process. STARCs should be required to identify and assess the affordability of designing, building, operating, and maintaining indoor ranges as opposed to the costs of using existing ranges, weapons training simulators, or a combination of both. Affordability assessments should be used to validate a bona fide requirement and to determine whether Federal resources should be invested in future indoor range construction and rehabilitation.

The Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), agreed to develop a cost standard and methodology for assessing life-cycle operations and maintenance costs and future affordability and to revise existing policy requiring their use in the range validation process.

Adequacy of Indoor Range Ventilation Systems

STARCs reported closing or not even opening newly constructed or rehabilitated ranges because the range ventilation systems could not be certified as safe. Although the ranges were not usable, the STARCs received Federal reimbursement for at least part of their construction and rehabilitation costs.

Range Ventilation Certification. The majority of range rehabilitation projects funded from FY 1989 through FY 1997 involved installing new ventilation systems to meet minimum safety standards. In addition, all ranges built since 1980 were required to meet minimum safety standards. Airflow and ventilation systems must be designed to effectively control lead dust, fumes, and by-products of combustion. To be certified as safe, a range ventilation system must undergo tests. Ventilation systems must achieve an air velocity of 65 (plus or minus 10) feet per minute at the firing line with laminar airflow toward the bullet trap and evenly distributed over the firing lanes.

According to National Guard Bureau Regulation 415-5, "Military Construction Army National Guard (MCARNG) Project Development," November 30, 1990, State-contracted ARNG military construction projects must be "complete and usable" to receive Federal reimbursement.

Ranges With Faulty Ventilation Systems. STARCs in Maryland, Michigan, Puerto Rico, Texas, Iowa, Kentucky, New Jersey, and Tennessee reported indoor ranges that were closed because of ventilation problems. Maryland and Puerto Rico identified at least five newly constructed or rehabilitated ranges that would not be used because airflow and ventilation systems could not be certified as safe.

For example, the Maryland STARC reported three ranges that were never used because their airflow and ventilation systems did not meet minimum standards. The new indoor range in Laurel, Maryland, which cost $325,000, has never been used for live fire because its systems could not be certified. The Maryland STARC rehabilitated two indoor ranges for the 5th Regiment in Baltimore, Maryland, that could not be used because the ventilation and airflow systems

did not work properly. Although the Maryland STARC spent $571,000 on the Baltimore rehabilitation project, the ventilation system could not be certified.

The Puerto Rico STARC reported closing two new ranges at Toa Baja and Arroyo that were never used because of air circulation problems. The Toa Baja range was built in 1991 and the Arroyo range was built in 1989. Both ranges were built as part of overall armory construction projects. The Maryland and Puerto Rico STARCs have closed all indoor ranges.

Uncertified and Unusable Ranges Accepted and Funded. The State Adjutant General and the U.S. Property and Fiscal Officer in each state approve final acceptance and payment for ARNG construction projects. The State Adjutant General and U.S. Property and Fiscal Officer authorize final payment by signing National Guard Bureau Form 593R, "Project Inspection Report," which certifies that the "project is totally complete, with no exceptions, and ready for acceptance," on a specified date. Nevertheless, since 1980, the Federal Government had funded at least five indoor ranges with faulty ventilation systems, at least in part.

In October 1998, an official in the Office of the Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), wrote that states should contract with an architect-engineer to design a facility to meet all Federal and local codes. Failure to do so would be the designer's responsibility, and the Federal Government should not make final reimbursement of state contract costs for a range that was not acceptable and operable.

New ARNG Design Guide Provisions. On June 1, 1997, the Army National Guard Bureau, Installations Division, issued new Design Guide 415-1, "Design Guide for Armories." Appendix A of the Design Guide provides basic guidelines for a rifle range design. Design Guide criteria are meant to help range designers develop a construction design that will provide a safe, operable indoor firing range. Criteria were also provided for planning and retrofitting existing indoor firing ranges.

Design Guide 415-1 contains criteria for range issues not normally associated with range design, such as range acceptance, inspection, and contracting. National Guard Bureau Regulation 415-5, which provides guidance for ARNG military construction projects, was issued in 1990 and, therefore, does not reference Design Guide 415-1. Furthermore, design guide criteria focused on the STARC role for ensuring proper indoor range design and functioning and did not focus on the National Guard Bureau role and responsibilities and the need for more effective National Guard Bureau control and oversight.

Range Acceptance and Payment Criteria. As a matter of policy, the Federal Government does not reimburse the state for any portion of a military construction project that does not meet minimum Federal standards and criteria or that is not complete and usable. Several actions should be taken to ensure that reimbursement is not made unless minimum Federal standards are met. For example, National Guard Bureau Regulation 415-5 should be revised to

reference ARNG Design Guide 415-1. Indoor range criteria in the design guide for contracting, range inspection, acceptance, and Federal reimbursement issues also need to be included in Regulation 415-5.

Range design criteria should include a requirement for STARC personnel to submit all indoor range designs or design contracts to the National Guard Bureau, Safety and Occupational Health Division, for review and approval before it is forwarded, along with final plans and specifications, to the National Guard Bureau, Installations Division. Range acceptance and payment criteria should be revised to require indoor range inspections and ventilation safety certifications by a qualified Government industrial hygienist. Also, National Guard Bureau Form 593R, "Project Inspection Report," should be revised to require that the industrial hygienist's safety inspection and certification document be attached to the final Form 593R when it is signed by the STARC Adjutant General and the U.S. Fiscal Officer.

Joint Service Reserve Component Facility Boards Review

DoD established the Joint Service Reserve Component Facility Boards (the Boards) in each State to ensure that facilities are being fully used by two or more Reserve Components, wherever possible, before additional facilities are built. The Boards are also responsible for determining the most economical method of providing facilities.

Threshold for Board Review. Although the Boards routinely review and validate proposals for armory construction projects, they do not routinely review the need for indoor ranges that are built as part of an armory. Because stand-alone range proposals rarely exceed the amount for major military construction, the Boards do not routinely review and recommend proposals for stand-alone ranges or ranges built as additions to an existing facility.

From FYs 1989 through 1995, a National Guard Bureau project was funded as a major military construction project if it cost $400,000 or more. In 1997, that amount was increased to $1.5 million. The most expensive indoor range project that we reviewed will cost approximately $508,000 when it is completed. The Federal portion of the cost is $397,506. The cost of a typical 15-meter range is much less. Under current procedures, it is unlikely that the Boards would separately review any new range or range rehabilitation proposal.

Board Review and Oversight Needed. The high percentage of range closures indicates a need for more effective review and oversight of proposed indoor range construction. One way to strengthen the range validation process is to require Boards to separately review and recommend all proposed indoor range construction, regardless of cost.

The Director of Facilities, Office of the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), agreed to the need for Board review of all new range construction and rehabilitation proposals, regardless of the cost and type of funds.

Closed Ranges Valued at $54.6 Million

Indoor ranges valued at an estimated $54.6 million were unused or under-used and closed; therefore, the construction or rehabilitation of those ranges had little or no effect on weapons qualification and unit readiness.

New Ranges Valued at $52 Million Closed. We based the estimate on standard costs provided by Headquarters, U.S. Army Corps of Engineers, because actual costs for designing, constructing, and equipping ranges built as part of an armory were not listed separately on project documents. We then compared Army Corps of Engineers' cost estimates with the actual costs of indoor ranges that were recently built and equipped as "stand-alone" and "add-on" facilities. The resulting estimate of $222,720 for a 15-meter range appears to be reasonable (Appendix I). Thus, 233 ARNG and USARC indoor ranges, built since 1980 and then closed, had an estimated value of $52 million (233 at $222,720 each).

Rehabilitated Ranges Valued at More Than $2.6 Million Closed. The actual Federal cost of the 22 ranges that have been rehabilitated since 1989 and then closed is $2,610,324. National Guard Bureau officials provided a list of Federal costs for each range rehabilitation project. Officials at 28 of 33 STARCs, with a project on the ARNG Indoor Range Rehabilitation Program projects list, either confirmed the accuracy of the rehabilitation costs or provided corrections. See Appendixes F, "Army National Guard Indoor Range Rehabilitation Projects Since 1989," and G, "Army National Guard Rehabilitated Indoor Ranges Completed and Closed Since 1989" in this report.

Future Range Construction and Costs. Once the ARNG validates a training requirement, a range becomes part of the standard floor plan in new armories, armory additions, and armory modernization projects. For example, a new armory, with a 15-meter range, was completed in Evansville, Indiana, in June 1998. Over 90 armories are now more than 57 years old (built from 1939 through 1941) and being scheduled for replacement. An estimated 42 percent of all existing armories were constructed between 1957 and 1967, and over 11 percent are more than 57 years old. The ARNG Infrastructure Requirements Plan lists 618 armory construction projects that the STARCs proposed for Federal funding from FYs 1999 through 2003. During FYs 1992 through 1997, approximately 51 percent (119 of 235) of all new armory construction projects included indoor ranges. If this trend continues, 315 of the 618 proposed armory projects could include an indoor range. While it is unlikely that all 618 armory projects will be funded, they provide some measure for determining the potential for new indoor range construction. As of March 1999, the ARNG Military Construction program accommodated an average of two armories per year.

Weapons Qualification and Readiness

None of the STARCs surveyed reported a negative effect on small-arms qualification scores or on unit readiness as a direct or indirect result of indoor range closures. Interviews with National Guard Bureau training officials and a review of unit readiness reports revealed no readiness deficiencies because of

indoor range closures. National Guard Bureau and STARC officials reported that many units can accomplish training requirements with existing alternative indoor and outdoor ranges and weapons simulators without experiencing degradation in reported unit readiness ratings.

Nonetheless, use of nearby alternative outdoor ranges can result in costs for travel and subsistence and trade-offs in training time. Some STARCs still rely on indoor ranges for both prequalification practice and annual qualification firing requirements because no alternative ranges are nearby or because travel to alternate sites is considered too costly and time consuming. For example, the Alabama STARC reported, ". . . if all ranges were closed, we would have some units traveling as much as 4 hours, one way, to fire on an outdoor range. This would be much more costly than annual qualification firing on the regional indoor ranges." Furthermore, the weapons training simulators that STARCs now use require dedicated space and trainers.

The cost and practicability of using existing, alternative ranges and weapons training simulators varies according to location. However, STARCs that do not have funds to operate and maintain indoor ranges may be able to fund travel to outdoor ranges or to use training simulators because costs are derived from other funding sources. Although there may be no reported impact on weapons training, other training requirements may be affected because of excessive travel times or the costs of traveling to other facilities. Those issues would most effectively be addressed thorough careful and documented alternatives analysis and affordability assessments.

Revising Design Guide

Design criteria for ARNG and USARC indoor ranges were confusing and contradictory. They generally authorized space for a 15-meter (50 foot) distance from the firing line to the target line instead of the standard Army 25-meter distance. This condition existed because the ARNG and USARC did not revise their guidance to conform to the 1990 Army Corps of Engineers "Design Guide for Indoor Firing Range," and other Army guidance.

Department of the Army Field Manual 23-9, "M16A1 Rifle and M16A2 Rifle Marksmanship," July 3, 1989, states that "Units are permitted to use the 15-meter-scaled alternate course only if a 25-meter range is not available." STARCs that provided data on range size stated that most indoor ranges built as part of their armories had 15-meter firing lines. Generally, 15-meter ranges are limited to weapons in which .22 caliber and pistol ammunition can be fired. Many of the bullet traps in 15-meter ranges are not designed to fire full caliber M16 ammunition, which is the preferred ammunition for annual qualification requirements. In addition, Army guidance requires that a 25-meter range be used to "zero" the M16 rifle before qualification firing. Another limitation is that the Army Field Manual 23-35, "Combat Training With Pistols and Revolvers," has no 15-meter course of fire for the M9 pistol. The Operations and Training Officer, National Guard Marksmanship Training Unit, stated that some of the active 15-meter ranges were being used primarily to practice and participate in competitive marksmanship tournaments conducted with .22 caliber and air pellet rifles and pistols.

While some 15-meter indoor ranges are still being used, ARNG and USARC officials need to review the Army guidance on the limitations of 15-meter ranges in evaluating the need for new indoor range construction or rehabilitation.

Conclusion

Since 1980, ARNG and USARC officials approved the construction and rehabilitation of at least 255 indoor ranges that were not used effectively or efficiently to improve weapons qualification and unit readiness. The funds spent on the unused or under-used ranges could have been put to better use.

According to past trends and the ARNG Infrastructure Requirements Plan Update for FY 1998, as many as 315 new indoor ranges could be built in the future, although only about two per year are planned. Consequently, the National Guard Bureau needs better information so that it can make more efficient future resource decisions, and it needs to provide greater oversight to ensure that ranges are not built with Federal funds that cannot or will not be used for the intended purpose.

The requirement for an indoor range is based on a validated training requirement and such factors as distance to training and other criteria. However, the cost to operate and maintain the indoor ranges has become a significant factor that has not been adequately considered. As indoor ranges have been closed and not used, the National Guard has been able to find alternative training sources to avoid decreases in readiness. In approving the construction and rehabilitation of indoor ranges, the National Guard needs to consider the total life cycle cost of the indoor range. Thus, when making a decision concerning the need for an additional indoor range, the ARNG must balance the cost of alternative training sites, use of simulators, or other ways of meeting training requirements against the affordability of the life cycle costs for an indoor range.

Joint Service Reserve Component Facility Boards should provide oversight of indoor range proposals by reviewing and making recommendations on all range construction and rehabilitation projects. Additionally, indoor range requirements should be more clearly addressed in Military Construction Cooperative Agreements for new armories, and Federal reimbursement for armory and range construction should be contingent on the completion of safety inspections and ventilation system certifications. While ARNG officials proactively agreed to address several of the issues, actions are not complete, and other issues need to be resolved.

Management Comments on the Finding

The Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities) stated that her office will include in a revision to DoD Instruction 1225.8, "Programs and Procedures for Reserve Component Facilities and Unit Stationing," a requirement that acceptance of military

construction projects that include indoor ranges include a certification that the range is fully operable. The USARC stated that it would publish a memorandum establishing a formal policy of closing indoor small-arms ranges and preparing the ranges for conversion to weapons simulator training rooms. However, subsequently, the USARC instead proposed a change to AR-140-483, Army Reserve Land and Facilities Management, which would eliminate construction of indoor ranges in new USARC centers, and replace them with weapons simulator rooms.

Recommendations, Management Comments, and Evaluation Response

Based on comments from the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities), we deleted draft report Recommendation 1.e., which required consideration of simulators within a specified distance of the new construction or rehabilitation. We renumbered the other recommendation accordingly.

1. We recommend that the Assistant Secretary of Defense (Reserve Affairs) implement a standard methodology and cost factors for assessing new indoor range construction and rehabilitation that includes:

a. Total life-cycle cost estimates and affordability assessments of operating, maintaining, decontaminating, and eventually disposing of an indoor range as opposed to the cost of using alternate training facilities and technologies.

b. State Area Command certification of intent to pay recurring operations and maintenance costs for indoor ranges with State funds.

c. Location(s) and distance to facilities where small-arms prequalification training and qualification is being accomplished, and why the location(s) cannot continue to be used for those purposes.

d. Location and distance to all other military, Federal, State, municipal, and private outdoor and indoor range facilities that meet the appropriate Military Service standards, that are within 2 hours travel time from the applicant's armory or reserve center, and that are available for small-arms training and qualification.

e. Joint Service Reserve Component Facility Boards review of all proposed new range construction and rehabilitation projects, regardless of the estimated cost.

Management Comments. The Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities) concurred with most of the recommendations.

Evaluation Response. The comments from the Deputy Assistant Secretary of Defense for Reserve Affairs (Materiel and Facilities) were responsive. We deleted the recommendation with which the Deputy Assistant Secretary nonconcurred. No further comments are required.

2. We recommend that the Director, Army National Guard,

a. Revise National Guard Regulation 5-1, "Grants and Cooperative Agreements," October 1, 1997, to require that U.S. Property and Fiscal Officers include a statement on indoor ranges when preparing determination and findings of bona fide need as part of Military Construction Cooperative Agreements for new armories and armory additions.

Management Comments. The National Guard nonconcurred with the recommendation. However, it proposed amending the ARNG Indoor Range Requirements Checklist to require that the U. S. Property and Fiscal Officer and the State Plans, Operations, and Training Officer sign the checklist as well as the Construction and Facilities Management Officer. The National Guard also proposed revising NGB Form 593R, Project Inspection Report, to include language stipulating that the project, including indoor range if applicable, is totally complete, with no exceptions.

Evaluation Response. The actions proposed by the National Guard meet the intent of the recommendation. We ask that the National Guard provide a date for implementing the alternative solution.

b. Revise National Guard Regulation (AR) 415-5, "Military Construction, Army National Guard (MCARNG) Project Development," November 30, 1990, and other appropriate guidance, to include and require that:

(1) State Area Commands use the standard methodology and cost factors to be developed by the Director of Facilities, Assistant Secretary of Defense for Reserve Affairs (Material and Facilities), to assess the total estimated life-cycle cost and affordability of building an indoor range as part of a new armory construction or rehabilitation project.

(2) All applications for Federal funds for projects that include new construction or rehabilitation of indoor ranges, regardless of the estimated cost amount, be reviewed by the Range and Land Training Officer, National Guard Bureau.

(3) States submit all indoor range designs or design contracts to the National Guard Bureau, Safety and Occupational Health Division, for review and approval to ensure that the proposed indoor range design and ventilation equipment will provide the minimum laminar airflow specified in National Guard Regulation (AR) 385-15, "Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of Army National Guard Indoor Firing Ranges," March 30, 1990.

(4) A qualified industrial hygienist certify that a new or rehabilitated range is safe and usable and attach the certification document to the National Guard Bureau Form 593R, "Project Inspection Report," as a condition of final acceptance and Federal reimbursement.

Management Comments. The National Guard concurred with Recommendation 2b(2) and 2(b)3. The National Guard will:

(1) change current policy to require all indoor range projects be validated by the National Guard and that the Indoor Range Requirements Checklist be submitted with the DD forms 1390/91;

(2) require the state to submit its indoor ranges, designs, or design contracts to the National Guard Bureau's Safety and Occupational Health Office for technical review if the state does not have qualified individuals.

The National Guard nonconcurred with Recommendation 2b(1) and 2b(4). However, the National Guard proposed an alternative corrective action for Recommendation 2b(1) to provide interim guidance in an All States Letter requiring the states to submit a separate economic analysis and life-cycle study on any proposed range construction, addition, or rehabilitation. The National Guard proposed that its proposal in response to Recommendation 2a would meet the intent of Recommendation 2b(4).

Evaluation Response. The proposed corrective actions for Recommendations 2b(1), 2b(2), and 2b(3) meet the intent of the recommendations. The Project Inspection Report does not require the signature of an industrial hygienist or equivalent who is qualified to conduct an airflow or "smoke test" of the range ventilation system before acceptance. However, because three officials certifying to the acceptability and usability of the range will sign the report, we consider this an acceptable alternative solution. The officials should be clearly notified of the need for the review of test results by an industrial hygienist or equivalent who is qualified to conduct an airflow or smoke test of the range ventilation system before acceptance. We request that the National Guard provide dates for implementing the proposed corrective actions.

c. Revise National Guard Bureau Pamphlet 415-12 (Draft), "Facilities Engineering - Army National Guard Facilities Allowances," August 14, 1998, to provide an alternate space allowance for an Engagement Skills Trainer or other acceptable weapons simulator instead of an indoor range.

Management Comments. The National Guard Bureau disagreed with revising guidance to include specific criteria allowances for simulators. However, the National Guard Bureau did support raising the classification of indoor ranges and training-device and simulator areas to a special allowance category, which requires justification above and beyond current requirements.

The National Guard Bureau also stated that it would include indoor ranges and readiness centers with indoor ranges in the Facilities Installation Stationing Plan, which would provide increased visibility to those ranges closed or under limited use.

Evaluation Response. The alternative corrective actions proposed by the National Guard meet the intent of our recommendation. We request that the National Guard Bureau provide milestones for implementing the proposed alternative corrective actions.

Appendix A. Evaluation Process

Scope and Methodology

Work Performed. The ARNG Chief, Installation Division, provided a list of armory construction projects completed from FYs 1980 through 1997. We determined the number of ARNG ranges constructed since 1980 by comparing the ARNG list of all armory projects, which was provided by the Installations Division, with the ARNG list of known indoor range locations, which was provided by the ARNG Chief, Industrial Hygiene. In this way, we determined which armory projects in each state, completed since 1980, included the construction of an indoor range. We also reviewed ranges rehabilitated as part of the ARNG Indoor Range Rehabilitation Program to identify rehabilitated ranges in each state by funding year.

We requested data on indoor range construction and rehabilitation projects that received Federal funds from Construction and Facilities Management, Training, and Occupational Safety and Health Officers in 29 states, 1 territory (Puerto Rico), and the District of Columbia. We received responses from officials in 26 states, Puerto Rico, and the District of Columbia, who also provided information on the cost, status, use, and planned use of their indoor ranges. See Appendix H for a complete list of STARCs surveyed and total ranges reported.

We visited the Headquarters, U.S. Army Reserve Command; the Texas Army National Guard; the New Jersey Army National Guard; the Tennessee Army National Guard; and the District of Columbia, Army National Guard. We also visited 21 indoor ranges in Tennessee, Texas, New Jersey, Georgia, and the District of Columbia.

We compared a USARC list of all major construction projects completed since 1992 with a USARC list of the location and status of all indoor ranges to identify new or rehabilitated ranges. Information was not available on USARC construction projects completed before 1992.

We also reviewed environmental laws and lead and other hazardous waste regulations administered by the Environmental Protection Agency; occupational safety and health laws and regulations administered by the Occupational Safety and Health Administration; National Institute of Occupational Health standards; and DoD, Army, ARNG, and USARC range safety, training, and property management directives, instructions, regulations, manuals, policies, procedures, and design guides. Our analysis included a review of reports and surveys on indoor-firing-range management issues dating from 1975 to the present.

Limitations to Evaluation Scope. Because of the large number of indoor ranges believed to be in the ARNG and USARC inventory, compared with the Reserve Components of the Air Force, the Marine Corps, and the Navy, this report addresses only ARNG and USARC ranges. We focused on determining the extent to which newly constructed and rehabilitated ARNG and USARC

indoor live-fire ranges were being used to support small-arms marksmanship training and qualification, and whether the ranges were being constructed in accordance with applicable laws, directives, instructions, regulations, manuals, and other published guidance. We also assessed the adequacy of published guidance.

USARC officials do not intend to spend the funds necessary to build or rehabilitate any indoor ranges for future live firing. A list of all 391 USARC indoor ranges showed that some had already been converted to other uses such as storage rooms, and that only 11 were still being used for live-fire training. USARC training strategy includes cleaning and converting indoor range space, as necessary, for use as weapons simulator training rooms. For this reason, the primary focus of the evaluation is on ARNG indoor ranges.

Data on ARNG indoor range design, construction, and equipment costs were limited. Therefore, we used Army Corps of Engineers' cost estimates for construction of a new, typical 15-meter indoor range, and actual range equipment costs for a recent range project. In this manner, we determined the value of range facilities closed since 1980.

DoD-Wide Corporate-Level Government Performance and Results Act Goals. In response to the Government Performance and Results Act, the Department of Defense has established 6 DoD-wide corporate-level performance objectives and 14 goals for meeting these objectives. This report pertains to achievement of the following objective and goal:

- **Objective:** Maintain highly ready joint forces to perform the full spectrum of military activities.

- **Goal:** Maintain high military personnel and unit readiness. **(DoD-5.1)**

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the Defense Infrastructure Management high-risk area.

Use of Computer-Processed Data. We relied on computer-processed data provided by the ARNG and USARC to determine and validate the number and location of indoor ranges constructed since 1980 and rehabilitated since 1989. Only ranges constructed or rehabilitated since 1980 are included in the evaluation. Indoor ranges built or rehabilitated since 1980 were designed to meet recommended Federal standards and DoD policies for indoor range design, work practices, and housekeeping.

We did not perform any tests of general and application controls of the databases from which the number of newly constructed and rehabilitated indoor ranges was obtained. Although we found some inconsistencies and inaccuracies in the data, we were able to identify them and correct them through our field verification. As a result, the reliability of the data did not materially affect the results of our evaluation.

Evaluation Type, Dates, and Standards. We performed this program evaluation from April 1998 through October 1998, in accordance with standards issued and implemented by the Inspector General, DoD. Accordingly, we included tests of management controls considered necessary.

Contacts During the Evaluation. We visited or contacted individuals and organizations within DoD, the Environmental Protection Agency, the Occupational Safety and Health Administration, and the National Institute of Occupational Health.

Summary of Prior Coverage

During the last 5 years, the Inspector General, DoD, has issued one evaluation report discussing indoor firing ranges. However, earlier reports by the General Accounting Office and the Army Audit Agency suggest that indoor range construction and rehabilitation are a continuing issue.

Inspector General, DoD

Inspector General, DoD, Report No. 98-170, "Evaluation Report on Army National Guard and U.S. Army Reserve Command Small Arms Indoor Firing Ranges," June 30, 1998.

General Accounting Office

General Accounting Office Report No. B-200539, "Small Arms Ranges at Reserve and Guard Facilities (LCD-81-8)," October 15, 1980.

Army Audit Agency

Army Audit Agency Report No. NE 87-206, "Construction and Upgrade of Indoor Firing Ranges," August 19, 1987.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, requires DoD organizations to implement a comprehensive system of management controls that provide reasonable assurance that programs are operating as intended and to evaluate the adequacy of those controls.

Scope of Review of the Management Control Program. We reviewed the adequacy of management controls to ensure that STARCs and Army Reserve Regional Support Commands spent Federal funds to build or rehabilitate only those ranges needed to meet live-fire training and weapons qualification requirements. We assessed range justification and approval criteria, process,

policy, and procedures. We also assessed range design, operating, maintenance, and remediation policy, procedures, and standards.

Adequacy of Management Controls. We identified a material management control weakness for the ARNG as defined by DoD Directive 5010.38. ARNG and USARC management controls were either not used or not adequate to approve a new range construction or rehabilitation. Shortcomings existed in controls over the justification, review and approval process for new construction and rehabilitation of indoor ranges. There were also shortcomings in range design standards. All recommendations in the report, if implemented, will improve the ARNG management control. We will provide a copy of this report to the senior official responsible for management controls in the ARNG.

Adequacy of Management's Self-Evaluation. ARNG officials did not identify management of small-arms, live-fire indoor range construction and rehabilitation as an assessable unit and, therefore, did not identify or report the material management control weakness identified by the evaluation.

Appendix B. Design and Housekeeping Standards for Indoor Ranges

Federal Standards. The National Institute of Occupational Safety and Health (NIOSH) published Federal standards for operating and maintaining indoor ranges in U.S. Department of Health, Education, and Welfare Publication No. (NIOSH) 76-130, "Lead Exposure and Design Considerations for Indoor Firing Ranges," December 1976. NIOSH developed indoor range standards in response to data gathered during a 1973 through 1974 survey of nine indoor ranges used by law enforcement agencies. Composite data from the survey indicated that a potential health hazard existed at each range because of inorganic lead exposure:

> In all ranges the concentrations of lead increased as the number of shooters increased and it kept increasing after the number of shooters had been reduced, indicating that the ventilation system was incapable of preventing lead build-up in each range . . . the ventilation was inadequate to keep airborne lead levels below the standard.

In addition to poor ventilation, the data showed that overall housekeeping at the indoor ranges was poor. This was especially true of general, end-of-the-day cleaning and periodic cleaning and remediation of the bullet trap to control lead contaminants.

Before publication of the NIOSH standards, design criteria for most indoor ranges focused on gun safety, efficiency, and versatility. Usually the walls, floor, and ceiling consisted of bullet-resistant materials, and the shooter booths were bullet resistant and included automatic target spotters. Range design criteria still include these features, but they are not adequate to protect the health of range personnel and shooters. NIOSH developed range design and work practice standards to reduce or eliminate the health hazards associated with indoor firing ranges.

NIOSH standards include equipping indoor ranges with properly designed ventilation, filtering, and conditioning (heating and cooling) systems. NIOSH standards recommend that each range has its own ventilation system to prevent circulation of lead contaminated air from the range into other areas of an armory or training center. NIOSH further recommends routine range maintenance and periodic inspection and remediation programs to remove lead accumulations. In addition, the Occupational Safety and Health Administration regulates General Industry Standards, Title 29, Code of Federal Regulations, 1981 Edition, Part 1910, Section 1025, "Lead," that pertain to safe range operations.

DoD, Army, and ARNG Standards. The DoD, the Army, and ARNG began implementing Federal standards in the early 1980s. Guidance pertinent to the evaluation includes:

Department of Defense Directive 1000.3, "Safety and Occupational Health Policy of the Department of Defense," March 29, 1979, and Department of Defense Instruction 6055.1, "DoD Occupational Safety and Health Program," October 26, 1984.

Appendix B of the ARNG, "Instruction for Preparation of DD Forms 1390 and 1391 Series, Military Construction," December 1, 1997.

Army Corps of Engineers, "Design Guide for Indoor Firing Ranges," June 1990.

Headquarters, Department of the Army; Deputy Assistant Chief of Staff, Safety; Letter 385-91-1, "Inspection and Evaluation of U.S. Army Indoor Firing Ranges," March 26, 1991.

All States Letters, National Guard Bureau-Army Installations, Subject: "Criteria and Standards for Construction of Indoor Ranges at National Guard Armories," October 7, 1981, and June 25, 1982.

National Guard Regulation (AR) 385-15, "Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges," January 3, 1984, and revised March 30, 1990.

Appendix C. Comments on Ranges

We received the following comments from STARC officials during the evaluation.

1. A Tennessee STARC official reported that the STARC had 46 indoor ranges and that, "Currently, to the best of this office's knowledge, no-live fire training has taken place in the past 2 years and none is currently scheduled." The STARC restricted range firing because of possible lead contamination and a lack of ventilation to prevent further contamination. The Director wrote that closures had not affected unit readiness because, "Sufficient outdoor live-fire ranges exist at local training areas and active duty military posts to support individual and crew-served weapons familiarization and qualification." The STARC has a new, state-of-the-art training facility at Tullahoma, Tennessee.

2. The Texas STARC has closed all but one of its 42 indoor ranges, including 18 ranges built since 1980 and 2 rehabilitated since 1989. The active range was being used by a local college. In March 1993, a Texas STARC officer wrote, ". . . we had to close our indoor ranges due to possible lead contamination. The cleaning of the ranges to make them safe may be a very expensive proposition. Even after they are brought up to standard, there will be additional time and expense in maintaining the standard."

Texas STARC officials reported that unit commanders found alternative locations to conduct weapons familiarization and qualification. They also reported no evidence of major degradation in readiness from the range closures. Officials stated that they closed ranges because of insufficient State funds to pay for routine cleaning and maintenance by a contractor. Contractor estimates for routine cleaning services ranged from $5,000 to $10,000 per range per year. Contractor estimates for periodic decontamination were $25,520 per range. Officials were also concerned about the potential legal liabilities from lead contamination. In addition, an occupational health nurse in Texas stated that the results of airflow tests in some ranges have been unsatisfactory.

3. The Maryland STARC reported that the state had 33 indoor ranges. STARC officials closed all ranges and converted seven of them for other uses. Since 1980, Maryland built and closed 10 new indoor ranges and rehabilitated 2 indoor ranges at the 5th Regiment. The STARC was rehabilitating at the Ruhl Armory range with minor construction funds, but recently stopped work. Maryland also constructed a new range at the Laurel Armory as an add-on.

4. The Maryland STARC never used the new range in Laurel, Maryland, completed in 1996 for $325,000, because of problems with the new ventilation equipment. Although Maryland reported correcting the problem, the range was not retested because the STARC closed all ranges in the state. The two indoor ranges in the 5th Regiment Armory in Baltimore, Maryland, rehabilitated in 1996, could not be used because the ventilation systems and airflow systems do not work properly. The Maryland STARC spent $400,000 in Federal funds, plus

$171,000 in STARC funds, on the rehabilitation project. More construction work is planned to get the ventilation and airflow systems operating at recommended standards.

4. The Georgia STARC reported that all 56 indoor ranges were closed or were in the process of being closed, and that unit commanders experienced little or no impact on readiness. Unit commanders in Georgia have ready access to many standard Army outdoor ranges in Georgia and neighboring states. The Georgia STARC was also building a new regional training center.

5. Officials with the Kansas STARC reported that 3 of its 4 indoor ranges were active: the Topeka Armory (built in 1957, rehabilitated in 1989 at cost of $108,317), Lenexa Armory (built in 1988), and Goodland Armory (1989). A range built at the Fort Leavenworth Armory in 1990 was never used as a range. It was closed and was being used for storage. The reason for closing the range at the Fort Leavenworth Armory was that the indoor ranges at the Topeka Armory and the Lenexa Armory were less than 1 hour away and Kansas units used those ranges instead. The STARC reported that all new armories constructed in Kansas will have simulator rooms instead of indoor ranges.

6. The Florida STARC closed all of its 42 indoor ranges. Florida built 10 new ranges between 1980 and 1997. Since 1989, Florida rehabilitated two indoor ranges at the Miami Armory ($115,678) and the West Palm Beach Armory ($119,546). Both projects were funded with FY 1989 ARNG Indoor Range Rehabilitation Program funds. Funding for the ranges was 75 percent Federal and 25 percent State. The STARC received contractor estimates as high as $40,000 per year for operations and maintenance costs to keep ranges open and operating safely. In 1998, the Assistant Adjutant General directed the closing of all indoor ranges.

Florida had a three-phase plan for closing ranges. First, they will clean up and dispose of sand and lead in 23 ranges with sand bullet traps. Two of the facilities with ranges will be given to the cities of Belle Glade and Cedar Hill, Florida, once they are cleaned. They budgeted $286,000 for this purpose in FY 1998. Second, nine ranges had lead contamination but did not have a sand trap. The range is a separate room. Florida's long-range plan includes cleaning and converting all indoor ranges to other uses and using only outdoor ranges for small-arms familiarization and qualification firing.

7. The Michigan STARC had 31 indoor ranges and reported in July 1998, "The State of Michigan has struggled with the use of indoor ranges and has been unable to utilize them effectively. Because of the unobtainable air quality standards and the increased safety restrictions, the State looked at the economic options of traveling to outdoor ranges versus the cost of range upgrades and long-term operating costs for lead cleanup. The decision was made to allow unit commanders to close their ranges and reuse the space." Eight of the nine ranges built since 1980 by the Michigan ARNG were closed. These included a 15-meter range at Calumet, Michigan, built as a separate building for $224,890 in 1993. Michigan closed the ranges in response to the 1992 National Guard Bureau memorandum indicating that all indoor range cleaning was a State funding responsibility. The Michigan ARNG planned to open the Calumet

range for prequalification and qualification training using a type of frangible ammunition that reportedly contains no lead in either the primer or the ball.

8. The Illinois STARC had 53 indoor ranges. In May 1998, an Illinois STARC official wrote, "The closing of indoor ranges started in 1987 with the final range closed in 1992." Between 1980 and 1986, the Illinois ARNG built five new ranges designed to meet the range ventilation and airflow standards. These ranges were the only ones open after 1989. Records show that the Illinois STARC built or rehabilitated eight other ranges between 1986 and 1992. "Because of the timing of the closings, these ranges were never fired on and are being used to meet other unit space requirements. The Illinois Department of Military Affairs did not have the estimated $5,000 per range in annual cleaning funds in the State operating budget."

9. The New Jersey STARC had 22 indoor ranges that were all closed. Since 1992, the New Jersey STARC spent approximately $700,000 to clean, abate, and close all 22 indoor ranges. New Jersey STARC officials reported that new requirements for designing, cleaning, and decontaminating indoor ranges increased the costs of operating and maintaining indoor ranges significantly. Three of the closed ranges were built since 1980. One range was to be rehabilitated with FY 1995 ARNG Indoor Range Rehabilitation Program funds, but the project was not completed at the time of our 1998 on-site visit.

Since about 1992, when all New Jersey STARC indoor small-arms ranges were closed, units have used nearby outdoor ranges and the outdoor ranges at the Army Reserve and National Guard Training Center at Fort Dix, New Jersey, and at Fort Drum, New York, for training and qualification on small-arms weapons.

In 1998, the STARC was actively pursuing reopening and rehabilitating six of the closed ranges. While the STARC said that they still could not afford to operate and maintain all 22 indoor ranges, travel and training funds had been drastically reduced, so they had to curb current travel costs. One way to do this was to reopen and start using indoor ranges in strategic regional areas. The STARC wants to reopen the six indoor ranges that have been inactive at Tom's River, Flemington, Woodbury, Washington, Hackettstown and Sea Girt, New Jersey. All except Sea Girt are 50-feet ranges that are located in armories. Three ranges were inspected and tested for reopening but none could be reopened without some rehabilitation. The range at Sea Girt, New Jersey, was undergoing an expensive rehabilitation as a test site for new range equipment, even though there is one outdoor range within walking distance, another indoor range is 20 miles away, and the outdoor ranges at Fort Dix are only 40 miles, or 60 minutes, away.

10. The Missouri STARC had 50 indoor ranges (only 47 were reported by the STARC, but a 1997 list showed 50 ranges by location). During the period from December 16, 1991, through May 2, 1992, the Missouri STARC closed all of its indoor ranges. During FYs 1993 through 1995, 42 indoor ranges were remediated under contracts with Heritage Environmental Services, Inc.

The Missouri STARC reported that five ranges built since 1980 were never used for live firing: Aurora Armory (built 1991), Boonville Armory (1990), Harrisonville Armory (1988), Ike Skelton Training Site-STARC HQ Armory (1992), and Monett Armory (1990). For example, the HQ STARC Armory range was never used for live fire and was converted to an Engagement Skills Trainer simulator room. One more range at the new Springfield Armory was due to be completed by June 1998.

The STARC reported that three indoor ranges were rehabilitated since 1989 at the following armories: Harrisonville Armory (1991) for $106,360, Jackson Armory (1989) for $72,704, and Lexington Armory (1989) for $104,256. Estimates did not include the cost of design or contract administration. The indoor range at the Harrisonville Armory was never used for live firing even after it was rehabilitated because of mounting environmental concerns. It is presently used for storage. If an Engagement Skills Trainer simulator becomes available in the future, this range could be reused to house the simulation system. The indoor ranges at Jackson and Lexington were remediated under contract and were being used for storage purposes.

The Missouri Army National Guard used outdoor ranges to qualify personnel either at Active Component installations or National Guard Training Sites. The one fielded EST simulator system was housed at the HQ STARC Armory and was used for train-up before qualification. While a simulator room is an exception to the standard ARNG indoor range, it is now considered standard in Missouri.

11. The Kentucky STARC has 24 indoor ranges, but only 4 are active. Kentucky built 12 new ranges since 1980; 6 were never used, 2 were closed, and 4 were active. Two ranges were rehabilitated, and both were active. Two simulator rooms were being built; one at the Ford Regional Training Center was complete and one at the Artemus Training Center was under construction. Training sites were authorized Engagement Skills Trainers simulators and the Federal government funded 75 percent of the costs.

12. The Louisiana STARC had 55 indoor ranges. One new range was being constructed at Napoleonville Armory, 12 were actively used for live-fire, and 43 were inactive. Of 14 ranges built since 1980, 7 were active, 7 were inactive. The new range at Clarks was inactive because of ventilation problems. Six ranges have been rehabilitated since 1980 with Federal ARNG Indoor Range Rehabilitation (AIRR) program money. Of $800,322 spent on rehabilitating ranges since 1989, 75 percent was Federal money, and 25 percent was state money. Abatement costs for six active ranges varied from a low of $3,725 to a high of $5,570; costs total $26,410 for all six ranges reported for an average periodic abatement cost of $4,401 per range. Estimated costs for contractor services to abate 35 closed ranges between FY 1993 and FY 1999 varied from $6,760 to $21,652; total costs were estimated at $472,752 for an average cost per range of $13,507. The STARC reported that funding for all range abatement projects was and is anticipated to be 100 percent federally funded.

13. Maine had 21 ranges. Although three were listed as active and usable, only one was being used. The STARC built one new range at the Bangor Armory in 1992, rehabilitated two ranges since 1989, and closed 20 ranges because of the

high costs of operating and maintaining them. The Maine STARC used outdoor ranges and weapons training simulators instead of indoor ranges. Maine built a new outdoor baffled range at the Bangor Armory and installed an Engagement Skills Trainer at Camp Keys in Augusta.

14. The Oregon STARC had 23 indoor ranges; 10 were active and 13 were closed and converted to storage, offices, vehicle repair, and a locker room. The STARC cleaned 13 indoor ranges using the sand and lead from the backstop as an aggregate in the concrete, which cost approximately $65,650. Since 1980, the STARC constructed six new ranges; five were active and one was closed and converted. Since 1989, the Oregon STARC rehabilitated the 50-foot range at the McMinnville Armory ($83,599), and a 25-meter range at the Roseburg Armory ($89,914). Both ranges were active. The projects received Federal funds in FY 1989 and were completed in 1994.

Nine active ranges cost $13,942 to operate and maintain in FY 1997. Full-time unit personnel were trained and medically screened as part of the lead cleanup and periodic maintenance program.

Plans for future design and construction of indoor ranges hinge on whether a true qualification table, accepted by the Army, could be developed for simulators. Simulators were used for training and occupational proficiency, but were not accepted as a means for yearly qualification. Once the standard is changed, the STARC will complete a cost analysis to identify the best fiscal approach for meeting qualification requirements. Oregon did not have a regional training center.

15. The Pennsylvania STARC had 57 indoor ranges that were used heavily until 1989. In 1989, all ranges were surveyed and only those that met safety and environmental standards were left open. The Adjutant General decided to close 39 indoor ranges because they did not meet the safety and health standards--33 were closed permanently. Of the 24 remaining ranges, 16 were never used (14 of those are scheduled for cleanup and conversion) and 8 ranges were still actively used for live firing. Since 1980, the Pennsylvania STARC built one new range at the Butler Armory, which was still active. No ranges have been rehabilitated with Federal funds since 1989.

16. The Puerto Rico Army National Guard had 23 indoor ranges. None are active and many have been converted. Since 1980, five new ranges were built and closed. Two of the five ranges, one at the Arroyo Armory and one at the Toa Baja Armory, were never used because of problems with the ventilation systems. Since 1989, Puerto Rico rehabilitated two ranges at the Cayey Armory ($130,760) and the Hato Rey Armory ($144,850), which are closed. The environmental problems they created and the lack of funds to properly maintain them were the main reasons for this decision.

17. The South Carolina STARC had 71 indoor small-arms ranges; 69 ranges were not being used for live fire and two indoor ranges at the Spartanburg and Columbia Armories were active. The 20 new ranges built since 1980 were used very little before they were closed. Since 1989, two ranges were rehabilitated, and only one of those was active.

Recent tests showed that 17 of 68 ranges lead levels that required cleaning and decontaminating. The STARC may use the U.S. Naval Hazardous Waste Team in Charleston to remediate the contaminated ranges. Forty-four ranges were used for purposes such as storage, lounges, locker rooms, classrooms, training rooms, and conference rooms.

The central training facility in Eastover was equipped with weapon simulators and outdoor live-fire ranges that were used by all units in the state. The STARC completed a "Pop-up" Combat Pistol Range that was the primary means for small-arms qualification for South Carolina units. The STARC experienced no degradation in readiness since this became the primary means of qualification. Also, very few ranges were ever used for small-arms live fire.

18. The South Dakota STARC reported 34 indoor ranges, of which 7 were active and 27 were inactive. The STARC built 6 new ranges since 1980, and all were active. Since 1989, the STARC rehabilitated the range at the Brookings Armory at a cost of $116,802 in Federal funds. The range was still active. The STARC reported that energy costs increased by $10 per hour when an indoor range ventilation system was operating.

19. The Virginia STARC had 18 indoor ranges in its inventory and all were closed. The Norfolk and Roanoke indoor ranges were over 35 years old and were cleaned and converted to permanent storage. Since 1980, the STARC built 14 ranges that were never used for official National Guard small-arms firing. Twelve ranges were converted to storage.

20. USARC officials reported two indoor ranges were never used for live-fire training because they were not needed. The first range was built and equipped in 1993 as part of a new reserve center in Vicksburg, Mississippi. The second range was built in 1996 as part of a new reserve center in Toledo, Ohio. The air ventilation systems, bullet traps, shooters' booths, and other range equipment were never installed. An outdoor range, located 46 miles away at Camp Perry, Ohio, was used by both USARC and ARNG units.

Appendix D. Ranges Built 1980 - 1997

STATE ARNG	RANGES BUILT	ACTIVE	CLOSED	NEVER USED	LITTLE USED
AK	2	0	2		
AL	27	16	11		
AR	7	2	5		
AZ	5	1	4		
CA	1	0	1		
CO	3	3	0		
CT	1	0	1		
DC	1	1	0		
DE	0	0	0		
FL	10	0	10	7	
GA	3	1	2		1
GU	0	0	0		
HI	1	0	1		
IA	11	11	0		
ID	1	0	1		
IL	13	0	13	7	
IN	6	5	1		
KS	3	2	1	1	
KY	12	4	8	6	2
LA	14	7	7		
MA	2	1	1		
MD	10	0	10	4	
ME	1	0	1		1
MI	9	1	8		1
MN	9	9	0	3	
MO	10	0	10	5	2
MS	16	5	11		2
MT	3	2	1		
NC	16	8	8		
ND	5	5	0		
NE	2	2	0		
NH	0	0	0		
NJ	3	0	3		
NM	8	0	8		
NV	2	2	0		
NY	2	0	2		
OH	2	0	2		
OK	No data available				
OR	6	5	1		
PA	1	1	0		
PR	5	0	5	2	
RI	1	0	1		
SC	20	0	20		20
SD	6	6	0		
TN	33	0	33	4	2
TX	18	0	18	6	12
UT	3	2	1		
VA	14	0	14	14	
VI	2	0	2		
VT	0	0	0		
WA	4	4	0		

STATE ARNG	RANGES BUILT	ACTIVE	CLOSED	NEVER USED	LITTLE USED
WI	13	12	1		
WV	4	3	1		
WY	6	5	1		
TOTAL	357	126	231	59	43

STATE USARC	RANGES BUILT	ACTIVE	CLOSED	NEVER USED	LITTLE USED
Ohio	1	0	1	1	0
Miss	1	0	1	1	0
TOTAL	2	0	2	2	0

COMPONENT	RANGES BUILT	ACTIVE	CLOSED	NEVER USED	LITTLE USED
ARNG	357	126	231	59	43
USARC	2	0	2	2	0
TOTAL	359	126	233	61	43

Appendix E. Ranges Built and Never Used 1980-1997

Illinois - 7 ARNG ranges

1. Machesney Park Armory (1993)
2. Decatur (1993)
3. Woodstock (1993)
4. Quad Cities NG Armory (1996)
5. Bartonville, Peoria JAFRC (1991)
6. Peoria AASF #3 and OM (1982)
7. Marion Army & OMS (1993)

Missouri - 5 ARNG ranges

8. Aurora Armory range (1991)
9. Boonville Armory (1990)
10. Harrisonville Armory (1988)
11. HQ STARC Armory, Ike Skelton Training Site, Jefferson City, MO (1992)
12. Monett Armory (1990)

Florida - 7 ARNG ranges

13. Crystal River (1988)
14. Brooksville (1995)
15. Ocala (1985)
16. Orlando (1990)
17. St. Augustine, HQ STARC, Robert F. Eisslen Armory (1992)
18. Tallahassee (1991)
19. Wauchula (1994)

Mississippi- 1 USARC range - no cleanup funds

20. Vicksburg (1993)

Ohio - 1 USARC range - never used for live firing, built as a congressional add-on, USARC engineer determined the range was not needed and did not meet training requirements; therefore, the range was never completed and equipped (just a shell).

21. Toledo (1996)

Tennessee - 4 ARNG ranges

22. Dresden (1989)
23. Gordonville (1992-1993)
24. Bolivar (1989)
25. Selmer (1993)

Texas - 6 ARNG ranges

26. Corpus Christi (1994)
27. Laredo (1993)
28. Waco (1991)
29. Temple (1991)
30. Weslaco (1994)
31. Dallas (1989)

Puerto Rico - 2 ARNG ranges - ventilation problems

32. Arroyo (1989)
33. Toa Baja (1991)

Kansas

34. Ft. Leavenworth Armory - 1990

Kentucky - 6 ARNG ranges

35. Harlan (1980)
36. Ravenna (1980)
37. Richmond (1980)
38. Walton (1980)
39. Springfield (1981)
40. Frankfort (1986) - Never equipped

Maryland - 4 ARNG ranges - ventilation systems faulty, cannot be certified

41. Ruhl (1997)
42. 5th Regiment (1994) range 1
43. 5th Regiment (1994) range 2
44. Laurel (1994)

Michigan - 3 ARNG ranges may be reopened to use with plastic, frangible ammunition only

45. Detroit Olympia (1994)
46. Washtenaw (1991)
47. Calumet (1993)

Virginia - 14 ARNG ranges - all converted to storage space

48. Allegheny (Clifton Forge) Armory (1990)
49. Charlottesville Armory (1989)
50. Emporia Armory (1993)
51. Fredericksburg (1989)
52. Gate City Armory (1985)
53. Harrisonburg Armory (1990)
54. Leesburg Armory (1989)
55. Lynchburg (1983)
56. Manassas Armory (1989)
57. Petersburg Armory (1989)
58. Sandston Armory (1991)
59. South Boston Armory (1986)
60. Staunton Armory (1989)
61. Warrenton Armory (1990)

Total 61

Appendix F. Army National Guard Indoor Range Rehabilitation Projects Since 1989

STATE	REHABS	ACTIVE	CLOSED	NEVER USED	LITTLE USED
Alaska	1	0	1		
Alabama	6	6	0		
D.C.	1	0	1		
Delaware	1	1	0		
Florida	2	0	2		
Georgia	2	2	0		
Iowa	4	4	0		
Idaho	2	0	2		
Illinois[1]	3	0	3	3	
Indiana[2]	3	3	0		
Kansas	1	1	0		
Kentucky	2	2	0		
Louisiana	6	6	0		
Maryland[3]	2	0	2	2	
Maine	2	1	1		
Missouri	3	0	3	1	
New Jersey	0	0	0[4]		
Oregon	2	2	0		
Puerto Rico	2	0	2		
So. Carolina	2	2	0		
So. Dakota	1	1	0		
Texas	2	0	2		
Virginia	1	0	1		
Minnesota	4	4	0		
Mississippi	2	2	0		
Montana	2	1	1		
No. Dakota	1	1	0		
Nebraska	1	1	0		
Utah	1	0	1		
Vermont	1	1	0		
Wisconsin	2	2	0		
Wyoming	1	1	0		
Total	**66**	**44**	**22**	**6**	

[1]Illinois: 3 ranges rehabilitated with AIRR program funds; E. St. Louis range not on AIRR program list.
[2]Indiana: 3 ranges rehabilitated with AIRR program funds- Gary range not on AIRR program list.
[3]Maryland: 2 ranges rehabilitated at 5th Regiment, Baltimore.
[4]Rehabilitation project at Sea Girt, New Jersey, has been funded, but work has not yet started on the range. As a result, this project was not included in totals.

Appendix G. Army National Guard Rehabilitated Indoor Ranges Completed and Closed Since 1989

Location	FY Funded	Cost	Status
1. Miami, FL	1989	$115,678	Closed
2. Harrisonville, MO	1991	106,360	Never Used
3. Jackson, MO	1989	72,704	Closed
4. Lexington, MO	1989	104,256	Closed
5. Missoula, MT	1989	105,868	Closed
6. Hato Rey, Puerto Rico	1989	144,850	Closed
7. Cayey, Puerto Rico	1989	130,760	Closed
8. Ft. Worth, TX #2	1989	115,318	Closed
9. Dallas, #5 TX	1989	165,107	Closed
10. Mount Pleasant, UT	1989-94	94,573	Closed
11. South Boston, VA	1989	9,851	Closed
12. DC, Anacostia (NAS)	1991	41,598	Closed
13. E. St. Louis, IL	1989	126,570	Never Used
14. Bloomington, IL	1989	139,135	Never Used
15. Kewanne, IL	1995	118,947	Never Used
16. Waterville, ME	1989	116,270	Closed
17. Baltimore, MD	1991	200,000	Never Used
18. Baltimore, MD	1991	200,000	Never Used
19. West Palm Beach, FL	1989	119,546	Closed
20. Kotzebue, AK	1989	81,368	Closed
21. Post Falls, ID	1991	132,474	Closed
22. Rexburg, ID	1991	169,091	Closed
Total 22 ranges		**$2,610,324**	

*Not on ARNG Indoor Range Rehabilitation (AIRR) Program List

Appendix H. State Area Commands Surveyed

STATE	TOTAL RANGES
1. Alabama	56
2. Alaska[1]	3
3. California	30
4. Delaware	5
5. D.C.	3
6. Florida[1]	42
7. Georgia	56
8. Idaho[1]	2
9. Illinois[1]	53
10. Indiana	8
11. Iowa	50
12. Kentucky	24
13. Louisiana	55
14. Maryland[1]	33
15. Maine	21
16. Michigan	31
17. Minnesota	N/R
18. Missouri[1]	50
19. Montana	N/R
20. New Jersey[1]	22
21. Oregon	23
22. Puerto Rico[1]	23
23. So. Carolina	71
24. So. Dakota	34
25. Tennessee[1]	46
26. Texas[1]	42
27. Kansas	4
28. Wyoming	20
29. Utah	N/R
30. Virginia[1]	18
31. Pennsylvania	57
TOTAL	**882**[3]

[1]All ranges are closed; Texas closed all but one range.
[2]STARC did not respond to request for information.
[3]ARNG reported 1,125 indoor ranges in total inventory. Our survey revealed 1,379 in the total inventory for a difference of 255 additional ranges. Ranges surveyed in 28 STARCs represent approximately 64 percent (882 of 1,379) of total ARNG ranges.

Appendix I. Range Value Estimates

We used a Facility Unit Cost Table provided by the Army Corps of Engineers as a basis for estimating the value of closed 15-meter indoor ranges, which was the most common size of closed ranges. The table was provided to Army units as a guide for preparing and reviewing military construction cost estimates for FY 1998 and FY 1999. Using table estimates and applying size adjustment factors, an 1,800-square-foot, 15-meter indoor range was valued at $110 per square foot, or $198,720. This amount includes air ventilation equipment and lighting, but not the bullet trap or other range equipment.

In addition to construction costs, STARCs required an estimated $24,000 to equip a new indoor range. This estimate was based on the actual cost of equipping a 5-lane, 15-meter range in Evansville, Indiana, that was completed in 1998. Equipment costs included a bullet trap that was rated for pistol, shotgun, and frangible or subcaliber ammunition used in an M16 rifle, but not full caliber M16 ammunition. The estimate also included ceiling and wall baffles, firing booths, and manually operated target retrieval devices. Combining construction and equipment costs resulted in a total estimate of $222,720 for a typical 1,800-square-foot, 15-meter indoor range. A typical 25-meter, 2,300-square-foot range would cost approximately $277,000.

We compared our estimate to the reported costs of two new 15-meter indoor ranges that were built recently as separate projects. The first was an indoor range at Laurel, Maryland, built and equipped in 1996 as an add-on facility for a total cost of $325,000 in Federal funds. The second was an indoor range built as a stand-alone facility in 1993 in Calumet, Michigan. The Calumet range reportedly cost $224,890 in Federal funds for both construction and equipment. On the basis of the comparison, an estimated value of $222,720 for existing ranges is both reasonable and conservative.

The ARNG believes the estimated value of the ranges could be about one-half of our generated estimate because our basis of comparison was for recently constructed ranges instead of ranges built in the mid- to late 1980s when less stringent environmental, health and safety standards were in effect. Whereas there may be some validity to this argument, many of the environmental standards applying to indoor ranges were issued in the mid-1970s to early 1980s and therefore should have been considered in costing the ranges built in the mid- to late 1980s. Army initiated clean up policies in the early 1990s which would affect ranges constructed later. Thirty-eight of the 61 ranges (62 percent) built, but not used were built in 1990 or later.

Appendix J. Report Distribution

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  Director, Defense Logistics Studies Information Exchange
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Under Secretary of Defense (Comptroller)
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Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Assistant Secretary of the Army (Installations, Logistics, and Environment)
Inspector General, Department of the Army
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Chief, U.S. Army Reserve Command
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Director, Army National Guard
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Office of Management and Budget
General Accounting Office
    National Security and International Affairs Division
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Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform

Assistant Secretary of Defense (Reserve Affairs) Comments

Final Report Reference

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
1500 DEFENSE PENTAGON
WASHINGTON, DC 20301 1500

RESERVE AFFAIRS

11 FEB 1999

MEMORANDUM FOR OFFICE OF THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE, ATTN: Thomas Gimble, Director, Acquisition Management Directorate

SUBJECT: Draft of a Proposed Evaluation Report on Construction and Rehabilitation of Reserve Component Indoor Small-Arms Ranges (Project No 7RO-5044 01, December 10, 1998)

We have reviewed the subject final draft report During the course of your investigation, emphasis shifted solely to the Army National Guard Therefore, comments provided below concerning each recommendation directed to this office are framed with respect to current practices of the Army National Guard Many of your recommendations will help with range management and will be reflected in the next revision of DoD Instruction 1225.8 (Programs and Procedures for Reserve Component Facilities and Unit Stationing), to be initiated within 60 days

A.1.a. Concur We will ensure that clear and concise language to separately address life-cycle operational costs for an indoor range is included in the next revision of Enclosure 3 to DoD Instruction 1225 8

A.1.b. Partially concur Language within the Military Construction Cooperative Agreement, required for each state-contracted military construction project, fully obligates the state to pay recurring costs for the entire facility, including any indoor range, for a period of 25 years from the date of acceptance We will work with National Guard Bureau and the Army National Guard staff to emphasize this requirement, which is currently covered by service regulation

A.1.c. Concur. We will ensure that such a requirement is added as part of the next revision of Enclosure 3 to DoD Instruction 1225.8.

A.1.d. Concur The next revision of Enclosure 3 to DoD Instruction 1225.8 will require components to consider all state or federal ranges available, in accordance with time-distance limits currently in place However, a requirement for states to consider municipal or private ranges is beyond our authority.

A.1.e. Nonconcur as written. When authorization documents (DD Forms 1390/91) for military construction projects are initially prepared, location of planned simulators and other training devices are generally not known at the state level Current Army Guard policy is that DD Forms 1390/91 for a project with a range, either outdoor or indoor, are to be validated by the training proponent at National Guard Bureau (NGB-ARO) Direction on the use of simulators in lieu of an indoor range is under NGB authority and responsibility

Deleted

Final Report Reference

Renumbered as Recommendation 1 e

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A.1.f. Concur Local Joint Service Reserve Component Facility Board (JSRCFB) members currently review all proposed major MILCON projects During the next revision of DoD Instruction 1225 8, we will amend Attachment 3 "PROJECT LIST" of Enclosure 1 to DoD Instruction 1225 8 to separately identify any indoor range planned as part of an overall project At that time, we will also add language in Paragraph A "GENERAL" of Enclosure 1 to DoD 1225 8 that will require JSRCFB members to review all projects funded under the MILCON account This should then include indoor small-arms ranges

Although not a separately identified recommendation, to either the Army Guard or to us, your entry on page 17 regarding acceptance and final payment requires a comment This office, as part of the next revision of DoD Instruction 1225 8, will include a requirement that final acceptance of a military construction project (either state or federally contracted) will include certification that an indoor range, if part of the project in question, is fully operable Said certification will be executed by the supervisory official of the federal agency having jurisdiction (US Army Corps of Engineers, Naval Facilities Command, or US Property & Fiscal Officer)

I want to take this opportunity to thank you for your diligence on this project Your evaluation team members (William Bazemore, Thomas Gimble, David Leising, John Speedy, Loretta Swanson, and Maj David Young) did an outstanding job I am sure that this report will benefit the Reserve components through conservation of scarce construction dollars My point of contact is Lieutenant Colonel Guy Griffin, 693-8110 Again, please pass to your staff my thanks for a job well done

Patricia J. Walker
Deputy Assistant Secretary of Defense
For Reserve Affairs (Materiel and Facilities)

cc:
Chief, National Guard Bureau
Director, Army National Guard

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Department of the Army, United States Army Reserve Command, Comments

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY RESERVE COMMAND
1401 DESHLER STREET SW
FORT MCPHERSON, GA 30330-2000

REPLY TO
ATTENTION OF

DAAR-IRP-L (36-2b) 2 Feb 99

MEMORANDUM FOR Office of the Assistant Inspector General for Auditing, Department of Defense, Acquisition Management Directorate, 400 Army Navy Drive, Arlington, VA 22202

SUBJECT: Evaluation Report on Construction and Rehabilitation of Reserve Component Indoor Small-Arms Ranges (Project No 7RO-5044.01), 10 December 1998

1 Our Command comments to the subject draft evaluation report are enclosed.

2. If you need additional information, please contact Mr John Price (800) 359-8483, extension 464-8183 or (404) 464-8183

FOR THE COMMANDER:

Frank J. Bono

FRANK J. BONO
Director, USAR Internal Review and Management Control Process

Encl

Final Report Reference

Page 2

U.S. Army Reserve Command (USARC) Comments

FINDING. (Page 5 of Draft Report)

USARC Standards and Policy. USARC officials told us they do not intend to spend the funds necessary to build or rehabilitate any indoor ranges for future live-firing. A list of all 391 USARC indoor ranges showed that some had already been converted to other uses such as storage rooms, and that only 11 were still being used for live-fire training. While the intent of USARC has not been established in formal policy, USARC officials provided information on "USARC Weapons Training Strategy for the 21st Century." According to a memorandum dated October 9,1997, signed by the USARC Deputy Commanding General, " .it is (my) intention to reengineer the weapons training process for the USARC." A key USARC strategic goal is to "Develop a home station weapons training and qualification alternative to current training and qualifications methods "

USARC training strategy includes cleaning and converting indoor range space, as necessary, for use as weapons simulator training rooms. For this reason, the primary focus of the evaluation was ARNG indoor ranges. However, the USARC should formalize its intent not to build or rehabilitate indoor ranges or USARC should take measures similar to those recommended in this report to ensure that unneeded ranges are not built or rehabilitated in the future At a minimum, the USARC should issue policy consistent with its stated intent to not build or rehabilitate any indoor ranges in the future

USARC Comments. By 28 February 1999, the USARC will publish a memorandum establishing a formal policy of closing indoor small-arms ranges and preparing these ranges for conversion to weapons simulator training rooms The USARC's "Weapons Training Strategy for the 21st Century" replaces cost prohibitive training with affordable training. This Strategy also will result in USAR soldiers meeting small-arms training requirements without the operational and environmental costs associated with indoor small-arms ranges.

National Guard Bureau Comments

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

NGB-IR (36-2b) 29 June 1999

~~MEMORANDUM THRU Commander, U.S. Army Corps of Engineers, ATTN: CEIR~~

~~Director of the Army Staff~~ ARUEL J. EDENS, JR., LTC, GS, DDECC

~~Assistant Secretary of the Army Installations, Logistics and Environment, ATTN: I&E~~

U S Army Audit Agency, ATTN: SAAG-PMO-S

FOR DOD Inspector General, ATTN AFU, 400 Army Navy Drive, Arlington, Virginia 22202-2884

SUBJECT Transmittal of Change to Response of "Draft Evaluation DODIG Audit Report – Construction and Rehabilitation of Reserve Component Small-Arms Ranges"

1. In response to a request of alternative solutions for the initial reply to the draft, SAB the enclosed attachment has been reviewed for management action and is transmitted for follow-up response.

2 Points of contact for this action are Mr Lane G Haskew, 703-607-0348 or Mrs Patricia A. Gallop, 703-607-0180

FOR THE CHIEF, NATIONAL GUARD BUREAU

WALTER T MORRISON
Director, Internal Review

Encl
as

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON, VA 22204-1382

NGB-ARI-C (415)

1 JUN 1999

MEMORANDUM THRU

~~THE CHIEF, TRAINING DIVISION, NGB-ART~~ RSM for (COL Krug) 1 Jun 99

~~THE CHIEF, AVIATION and SAFETY DIVISION~~, NGB-AVN-S, (LTC Bacon) JBacon 1 June 99 concur.

FOR THE CHIEF, COMPTROLLER DIVISION, NGB-ARC-M, (Ms. Pat Condon)

SUBJECT: Draft Evaluation DODIG Audit Report - Construction and Rehabilitation of Reserve Component Small-Arms Ranges

1. References:

a. Draft Department of Defense Inspector General (DODIG) Report, 10 Dec 98, subject: Construction and Rehabilitation of Reserve Component Small-Arms Ranges (Project No. 7RO-5044.01)

b. Memorandum from NGB-ARC-M, 23 Dec 98, same subject.

c. Memorandum from NGB-ARI to NGB-ARC-M, 15 Jan 99, same subject.

d. Memorandum from Deputy Assistant Secretary of the Army Installations and Housing (OASA) (I&E), 15 Mar 99, same subject.

2. In reference c NGB provided its nonconcurrence to the recommendation A.2 cited in reference report. The following alternative solutions are provided for consideration. The States will be provided interim guidance on all proposed changes, if acceptable to both DODIG and OASA(I&E) via issuance of an All States Letter.

a. A.2.a. Nonconcur. The DOD IG report recommended the revision of National Guard Regulation (AR) 5-1, "Grants and Cooperative Agreements", March 1999 (Interim), to require the United States Property and Fiscal Officers (USPFO) include a "bona fide" needs statement as part of the Military Construction Cooperative Agreement. Recommend the amendment of the Army National Guard (ARNG) Indoor Range Requirements Checklist to

require not only the Construction and Facilities Management Officer's (CFMO) signature, but also that of the USPFO and the State Plans, Operations, and Training Officer. In addition, NGB recommends the revision of NGB Form 593R, "Project Inspection Report", to include language stipulating that the "project is totally complete, with no exceptions, to include indoor range (if applicable), and was ready for acceptance on (date)." Because the NGB 593R is an internal NGB form, amending it should not take much time. Interim guidance will be provided via issuance of an All States Letter with the new form being posted on the NGB-ARI Web page as soon as the changes are staffed and approved.

b. A.2.b.(1). Nonconcur. The States and Territories, in accordance with AR 11-18, "Cost and Economic Analysis Program", are already required to conduct an Economic Analysis (EA) of each proposed Major Construction Army National Guard (MCARNG) construction project. Recommend that States be required not only to prepare and submit an economic analysis on the primary facility and its supporting facilities but also a separate economic analysis and life cycle study on any proposed indoor range construction, addition, or rehabilitation. Once approved, interim guidance will be provided via issuance of an All States Letter.

c. A.2.b.(2). Concur. Recommend changing current policy to make it mandatory that all indoor range projects (regardless of cost) be validated by NGB-ART. In addition, NGB proposes the amendment to NGR (AR) 415-5, to require the submission of an ARNG Indoor Range Requirements Checklist, signed by the State Plans, Operations, and Training Officer, on all indoor range projects (regardless of cost) with the DD Forms 1390/91 submission. Once approved, interim guidance will be provided via issuance of an All States Letter. Also, the update regulation will be posted on the NGB-ARI Web page.

d. A.2.b.(3). Concur. The specific technical review specified in the DODIG recommendation is the responsibility of the individual's States or Territory's Safety and Occupational Health Office, with Regional Industrial Hygiene Offices providing support to the State's or Territory's Safety and Occupational Health office. In the event there is no certified individual within the State or Territory's Safety and Occupational Health Office to conduct the technical safety review, the State will submit their

indoor range designs or design contracts to the National Guard Bureau's Safety and Occupational Health Office (NGB-AVN-S), for the referenced technical review. In any event, submission of designs and/or design contracts to the National Guard Bureau's Safety and Occupational Health Office for review and approval is required, although the Individual State's or Territory's Safety and Occupational Health offices provide final certification that a new or rehabilitated range is safe and usable. Additional assistance to the States and Territories in design review, if required, is also available upon request via the U.S. Army Center for Health Promotion and Preventive Medicine, located at Aberdeen Proving Ground, MD.

e. A.2.b.(4). Nonconcur. Paragraph "a" above meets the DODIG's recommended action.

f. A.2.c. Nonconcur. The revision of NGB PAM 415-12, Facilities Engineering, Army National Guard Facilities Allowances, to include specific criteria allowances to the Engagement Skills Trainer (or other acceptable weapons simulators) does not meet the intent of the pamphlet nor is it desired. Specific space allocations for any training device or simulator is contingent on approval by NGB-ART as well as the fielding schedule designated for each device. NGB does support addition of a "training device/simulator area" as a Schedule II, and the reclassification of indoor ranges from a Schedule I to a Schedule II item. This action would classify indoor ranges, as well as training device/simulator areas, as a special allowance, thus requiring additional justification above and beyond that of Schedule I items. Allocation and approval of space allowances for both would be considered on a case by case basis, subject to the approval of NGB-ART and NGB-ARI. Since NGB PAM 415-12 is an internal NGB document, amendment and approval should take minimum time. Interim guidance will be provided via issuance of an All States Letter. Also, the updated pamphlet will be posted on the NGB-ARI Web page.

3. In addition, NGB recommends the inclusion of indoor ranges and readiness centers with indoor ranges in the Facilities Installation Stationing Plan (FISP). This would provide increased visibility to those ranges closed or under limited use and allow NGB another tool to improve their validation process.

NGB-ARI-C
SUBJECT: Draft Evaluation DODIG Audit Report - Construction and Rehabilitation of Reserve Component Small-Arms Ranges

4. The NGB-ARI POC is LTC William A. Johnston, (703) 607-7919, DSN 327-7919.

5. Army Installations, The Foundation of Readiness.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

WARREN L. JOHNSON, JR.
COL, NGB
Chief of Installation

Evaluation Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report.

Thomas F. Gimble
Patricia A. Brannin
Loretta F. Swanson
David L. Leising
William F. Bazemore
Bernice M. Lewis
Krista S. Gordon
Jenshel D. Marshall